

Towards digital Islamic art history

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The field of Islamic art history as a whole has arguably adhered to a Rankean conception of history writing, inasmuch as it appears to see its primary task as the objective unearthing of facts with which to narrate a singular history.¹ Interpretive approaches for the most part have seldom strayed beyond the kind of art history envisioned by Erwin Panofsky, in which the meanings of works are derived from examinations of form, cultural specificities and historical environment. Although the rise of Critical and French cultural theory in the humanities after the 1970s – the so-called ‘cultural turn’ – has left its trace on the discipline of art history for better or worse,² Islamic art historians as a whole have been somewhat reluctant to explore the applicability of these theoretical perspectives. The fascinating theoretically informed studies that have been conducted by scholars like Gregory Minissale on the interpretation of Mughal miniatures,³ Shanti Kavuri-Bauer on the politics of cultural memory and conservation of Mughal architecture,⁴ Nancy Um on the urban development of the Yemeni port city Mocha in the transnational context of Indian Ocean trade networks,⁵ or Afsaneh Najmabadi, D. Fairchild Ruggles and Heghnar Watenpaugh on gender,⁶ remain relatively unusual and decades overdue. Explorations in world historical approaches, ironically pioneered by the Islamic historian Marshall Hodgson, and theories of transnationalism and cosmopolitanism are still in their early stages within the field of Islamic art history.⁷ Self-scrutiny of

¹ Historian Leopold Von Ranke (1795-1886) is known for his empiricist and positivist approach to writing history; he was also a teacher of Jacob Burckhardt (1818-97), a pioneering figure in the field of art history. Though Ranke saw history as both science and art, the Rankean approach has come to be synonymous with the view that the writing of history is primarily concerned with unearthing indisputable facts with which to construct authoritative narratives, a view that has been heavily and widely critiqued in the twentieth century.

² Margaret Dikovitskaya, *Visual Culture: The Study of the Visual after the Cultural Turn*, Cambridge, MA: MIT Press, 2005.

³ Gregory Minissale, *Images of Thought: Visuality in Islamic India 1550-1750*, Newcastle: Cambridge Scholars Publishing, 2006.

⁴ Shanti Kavuri-Bauer, *Monumental Matters: The Power, Subjectivity, and Space of India's Mughal Architecture*, Durham, NC: Duke University Press, 2011.

⁵ Nancy Um, *The Merchant Houses of Mocha. Trade and Architecture in an Indian Ocean Port*, Seattle, WA: University of Washington Press, 2009.

⁶ Afsaneh Najmabadi, *Women with Mustaches and Men without Beards: Gender and Sexual Anxieties of Iranian Modernity*, Berkeley, CA: University of California Press, 2005; D. Fairchild Ruggles, ed., *Women, Patronage, and Self-Representation in Islamic Societies*, Albany, NY: SUNY Press, 2000; Heghnar Zeitlian Watenpaugh, ‘Deviant Dervishes: Space, Gender, and the Construction of Antinomian Piety in Ottoman Aleppo’, *International Journal of Middle East Studies* 37(4), 2005, 535-65.

⁷ Marshall G.S. Hodgson, *The Venture of Islam: Conscience and history in a world civilization*, Chicago: University of Chicago Press, 1974; Abidin Kusno, *The appearances of memory: mnemonic practices of architecture and urban form in Indonesia*, Durham, NC and London: Duke University Press, 2010; Nebahat Avicioğlu and Finbarr Barry Flood, ‘Introduction: Globalizing Cultures: Art and Mobility in the Eighteenth Century’, *Ars Orientalis*, 39, 2011, 7-38.

the field's underlying theoretical assumptions began in earnest only in the past decade and a half, and the field's relationships with the broader disciplines of art history and Islamic studies have not yet been thoroughly examined.⁸

If the tentative and belated engagement undertaken in some quarters of Islamic art history with the intellectual trends shaping the encompassing fields of art history and the humanities in general is any indication, then there is, it would seem, a growing dissonance between the field of Islamic art history and a wider humanities that is swirling in the cultural turn. One could not be faulted for thinking a theoretical conservatism or even aversion runs through the field, if one did not stop to consider how few Islamic art historians there are relative to, say, historians of European art, or how until recently Muslim majority countries have not been major participants in the field. The depth and diversity of any academic discourse in the end depends on the number as well as the inclinations of its

⁸ Key texts scrutinizing the field's development in whole and in part include, but are not limited to: Oleg Grabar, 'Reflections on the Study of Islamic Art', *Muqarnas*, 1, 1983, 1-14; Janet L. Abu-Lughod, 'The Islamic City - Historic Myth, Islamic Essence, and Contemporary Relevance', *International Journal of Middle East Studies* 19(2), 1987, 155-76; Donald Malcolm Reid, 'Cultural Imperialism and Nationalism: The Struggle to Define and Control the Heritage of Arab Art in Egypt', *International Journal of Middle East Studies* 24(1), 1992, 57-76; Stephen Vernoit, 'The Rise of Islamic Archaeology', *Muqarnas*, 14, 1997, 1-10; Stephen Vernoit, ed., *Discovering Islamic Art: Scholars, Collectors and Collections, 1850-1950*, London: I.B. Tauris, 2000; Linda Komaroff, ed., *Exhibiting the Middle East: Collections and Perceptions of Islamic Art*, special issue of *Ars Orientalis*, 30, 2000; D. Fairchild Ruggles, *Women, patronage, and self-representation*; Kamyar Abdi, 'Nationalism, Politics, and the Development of Archaeology in Iran', *American Journal of Archaeology*, 105(1), 2001, 51-76; Robert Hillenbrand 'Studying Islamic Architecture: Challenges and Perspectives', *Architectural History*, 46, 2003, 1-18; Sheila S. Blair and Jonathan M. Bloom, 'The Mirage of Islamic Art: Reflections on the Study of an Unwieldy Field', *The Art Bulletin*, 85(1), 2003, 152-84; Oleg Grabar, 'Editorial: What should one know about Islamic art?', *RES: Anthropology and Aesthetics*, 43, 2003, 5-11; Mohammad Gholi Majd, *The Great American Plunder of Persia's Antiquities, 1925-1941*, Lanham, MD: University Press of America, 2003; Wendy M.K. Shaw, *Possessors and Possessed: Museums, Archaeology, and the Visualization of History in the Late Ottoman Empire*, Berkeley and Los Angeles, CA: University of California Press, 2003; Heghnar Zeitlian Watenpaugh, 'Sources and Methods for Studying Women and Islamic Cultures in the Disciplinary Field of Art and Architecture', in Suad Joseph, ed., *The Encyclopedia of Women and Islamic Cultures*, vol. 1, Leiden: Brill, 2003, 315-20; Heghnar Zeitlian Watenpaugh, 'Museums and the Construction of National History in Syria and Lebanon', in Nadine Méouchy and Peter Sluglett, eds, *The British and French Mandates in Comparative Perspective*, Leiden: Brill, 2004, 185-202; Oliver Leaman, *Islamic Aesthetics: An Introduction*, Notre Dame, IN: University of Notre Dame Press, 2004; Nasser Rabbat, 'Toward a Critical Historiography of Islamic Architecture', *Repenser les limites: l'architecture à travers l'espace, le temps et les disciplines*, Paris: INHA, 2005 [<http://inha.revues.org/642> accessed 24.03.2012]; Nader Nasiri-Moghaddam, *L'archéologie française en Perse? Et les antiquités nationales*, Paris: Connaissances et Savoirs, 2005; Finbar Barry Flood, 'From the Prophet to Postmodernism? New World Orders and the End of Islamic Art', in Elizabeth Mansfield, ed., *Making Art History: A Changing Discipline and its Institutions*, London and New York: Routledge, 2007, 31-53; Sibel Bozdoğan and Gülru Necipoğlu, eds, *History and Ideology: Architectural Heritage of the 'Lands of Rum'*, special issue of *Muqarnas*, 24, 2007; Margarita Diaz-Andreu, *A World History of Nineteenth-Century Archaeology: Nationalism, Colonialism, and the Past*, Oxford: Oxford University Press, 2007; Paula Sanders, *Creating medieval Cairo: empire, religion, and architectural preservation in nineteenth-century Egypt*, Cairo: American University in Cairo Press, 2008; Suzanne L. Marchand, 'Interpreting Oriental Art', in *German Orientalism in the Age of Empire: Religion, Race, and Scholarship*, Cambridge: Cambridge University Press, 2009, 387-426; Heghnar Zeitlian Watenpaugh, 'Art et architecture islamiques: des categories fluctuantes', *Perspective: La revue de l'institut national d'histoire de l'art*, 1, 2009, 91-8; Andrea Lerner and Avinoam Shalem, eds, *After 100 years: the 1910 exhibition 'Meisterwerke muhammedanischer Kunst' reconsidered*, Leiden: Brill, 2010.

participants. Whatever the reasons, it is tempting then to think that Islamic art history must 'catch up' in various ways in order to remain relevant as an academic discipline, perhaps by turning to the French cultural theorists of the twentieth century or following other fashionable intellectual directions.

However, there is a more significant historiographical transformation on the horizon, which may widen the scholarly divide even more. The cultural turn is being superseded by the digital turn. The advent of digital humanities (also termed 'humanities computing' or e-research) now poses the primary historiographical challenge for contemporary and future historians of Islamic art. The umbrella term 'digital humanities' refers to the use of computer technologies, especially databases, the internet and graphics applications, to facilitate, enact and report research in the humanities.⁹ It is important to recognize that digital technologies are no longer simply tools to archive and exchange information, but they are now also analytical instruments and communication platforms, and that these are embedded with theoretical assumptions which are often under-scrutinized. The ability to read texts and view images and video across space and time, to share them and to draw connections that are not apparent without computational enhancement, is accelerating rapidly. Increasingly, digital humanities scholars are starting to develop their own digital infrastructures and design their own technologies to service their own ends instead of adapting those envisioned by others.

Despite some noble attempts such as Archnet,¹⁰ the *Shahnama* project,¹¹ the Prince Sultan Ibn Salman Islamic Architectural Heritage Database of the Research Centre for Islamic History, Art and Culture (IRCICA),¹² the Chester Beatty Library Seals Project,¹³ segments of the ARTstor database,¹⁴ and the Discover Islamic Art database of the collective enterprise *Museum With No Frontiers*,¹⁵ as well as the efforts of various museums and national libraries in Europe and North America, future Islamic art historians are less well positioned than scholars of European, American and East Asian art to benefit from these advances, thus deepening the divide. The efforts of Islamic art historians and the broader field of Islamic studies to date pale in comparison with other fields in terms of the scale of the efforts, the use of computational analytics, the deployment of the most advanced technologies, and the digital infrastructures being built.

Thus, a list of ambitious and innovative projects of this nature undertaken in other areas of the humanities would include the Art Project, launched in 2011 by Google, one of world's leading technology companies. This offers dynamic high resolution digital interactions with works in prominent European and North

⁹ The international network of digital humanities centres, centreNet, boasts hundreds of members from around the globe, testifying to the field's considerable growth: CentreNet [<http://digitalhumanities.org/centernet/> accessed 24.03.2012].

¹⁰ ArchNet [<https://archnet.org/lobby/> accessed 24.03.2012].

¹¹ Shahnama Project [<http://shahnama.caret.cam.ac.uk/new/jnama/page/> accessed 24.03.2012].

¹² IRCICA [<http://www.islamicarchitecturedatabase.org/ircica/index.php> accessed 24.03.2012].

¹³ Chester Beatty Library Seals Project [<http://www.cbl.ie/islamicseals/>].

¹⁴ ARTstor [<http://www.artstor.org/> accessed 24.03.2012].

¹⁵ Discover Islamic Art–Museum With No Frontiers [http://www.discoverislamicart.org/database_searchform.php accessed 24.03.2012].

American museums.¹⁶ The early emphasis has been on Euro-American historical art, though this is slowly changing to include Asian art collections, including that of the Victoria and Albert Museum in London, and [now] museums from the Islamic world such as the Museum of Islamic Art in Qatar, The Israel Museum in Jerusalem and the Museum Nasional Indonesia. Beyond art history, the extraordinary Early English Books Online Database, which began as a collaboration between between ProQuest LLC, the University of Michigan, and Oxford University is a digital archive of the entire corpus of printed books produced in England, Ireland, Scotland, Wales and British North America from 1473 to 1700, with the ability to select images, to perform text searches on a portion of the collection, and to create an accompanying online scholarly community.¹⁷ A very different type of project is the cutting edge Hypercities site, which overlays different maps of various cities created throughout time and links places within the cities to complementary textual, visual and video data, but Tehran and Cairo are currently the only cities from the Islamic world that are included and there is relatively little accompanying data.¹⁸ The project team are currently developing an interactive tool called Geoscribe that relates places mentioned in texts to their corresponding points on the layers of interactive maps of cities.

Taiwan has furnished two truly remarkable examples of the large-scale digital archival project. The highly ambitious multidisciplinary Taiwan e-Learning and Digital Archives Program (TELDAP), which received US\$247 million from 2008 to 2012, has established a national digital archive of Taiwan's biological, ecological and cultural diversity that also aspires to gather and digitize Taiwanese cultural artefacts dispersed around the world.¹⁹ Even more pertinent to Islamic art history, perhaps, is the creation of the Research Center for Digital Humanities of National Taiwan University in 2006, which has created the Taiwan History Digital Library (THDL), a site that is comprehensively archiving documents relating to Taiwan from the Ming and the Qing periods, including land deeds, judicial court archives, Japanese colonial statistics, and the records of political parties and social movements in Taiwan.²⁰ Altogether, these exhaustive digital archiving efforts are being accompanied by innovative new spatial analytic and other computational tools that help one sift through the data and are indicative of not only Taiwan's but the Asia-Pacific's rapid embrace of digital humanities. Although these efforts are not all specifically art historical in nature, they show the kinds of digital foundations and infrastructure that future art historians of Europe, North America and East Asia will be able to build upon. When will comparable digital infrastructure initiatives for Islamic world studies be undertaken and who will build them?

¹⁶ Art Project [<http://www.googleartproject.com/> accessed 24.03.2012].

¹⁷ Early English Books Online (EEBO) [<http://eebo.chadwyck.com/home> accessed 24.03.2012]

¹⁸ Hypercities [<http://hypercities.com/> accessed 24.03.2012]. The core partners of the Hypercities project are University of California Los Angeles, University of Southern California, The City University of New York (CUNY) and CUNY-Baruch College, Pilipino Workers' Center, and Public Matters, Los Angeles.

¹⁹ Simon C. Lin and Eric Yen, 'An introduction to Taiwan e-Learning and Digital Archives Program (TELDAP)', *International Journal of Humanities and Arts Computing*, 6(1-2), March 2012, 2.

²⁰ Taiwan History Digital Library (THDL) [<http://thdl.ntu.edu.tw/> accessed 24.03.2012].

A pattern is emerging. Regions and fields that can bring together state sponsorship, industry partners, science computing experience and resources will be at the forefront of a digital shift that reflects the world's hierarchy of advanced industrialized nation-states and economies and their priorities. Already graduate students and researchers working in select fields can conduct large amounts of their research remotely and digitally, reducing costs for travel and archival work. Colleagues in humanities disciplines and fields of art history that successfully embark on the digital shift will be able to effortlessly scan through thousands of primary texts and images across centuries, perform statistical analyses on large pools of data, visualize complex relationships and correlations with geography and generate new genres of scholarship. Without a critical mass of systematically developed databases of historical texts, translations, and images with rigorous data quality controls and overlaying analytical tools, the way Islamic art history will be written will increasingly diverge from those fields of art history that embrace the digital shift more fully. This paper makes the case that the historiographical challenge which Islamic art historians face is not simply to consider and apply new theoretical frameworks, but to scrutinize and participate in the design and development of scholarly digital infrastructures, databases and analytical instruments specifically geared to the interests of Islamic art historians, while confronting the field's archival legacies.

The rise of digital humanities

Before the rise of digital humanities there was the rise of digital science. Decades ago, the fields of physics and biological sciences, for example, began a digital shift which involved placing large datasets in the digital domain and developing appropriate institutions such as the US National Center for Computational Sciences, founded in 1992.²¹ Impressive achievements have been made through computational science, the mapping of the human genome being one high-profile example.²² Such projects necessitate a very high degree of coordination: the immense scale of the data sets and the concomitant rise of hybrid specialists are noteworthy aspects of the digital shift. And now, leveraging the power of social computing networks to advance knowledge is seen as the next horizon.²³ As the digital historian Daniel Cohen observes, science's digital shift has given rise to large interstitial fields like bio-informatics; the same phenomenon has occurred in

²¹ National Center for Computational Sciences [<http://www.nccs.gov/about/> accessed 24.03.2012].

²² Completed in 2003 at a cost of around US\$3.8 billion, the thirteen-year international collaboration identified 20,000 to 25,000 genes and stored this data and other related data in databases, while developing custom data analysis tools. Human Genome Project Information [http://www.ornl.gov/sci/techresources/Human_Genome/home.shtml accessed 24.03.2012]

²³ Michael Nielsen, *Reinventing Discovery: The New Era of Networked Science*, Princeton, NJ: Princeton University Press, 2011; Thomas Lin, 'Cracking Open the Scientific Process', *The New York Times*, 16 January 2012 [<http://www.nytimes.com/2012/01/17/science/open-science-challenges-journal-tradition-with-web-collaboration.html>].

the social sciences and is now slowly emerging in the humanities in spite of the limited potential for profitable spinoffs.²⁴

The emergence of digital humanities has been traced back to the Jesuit priest Father Roberto Busa, who in 1949 approached IBM with a project to index 11 million words in medieval Latin drawn from the works of St Thomas Aquinas and others.²⁵ Since then the field has gradually expanded as technologies have grown exponentially, and for several decades humanities scholars have been grappling with the digital shift and its implications for scholarship. Reflecting on the emergence of digital history in particular, Cohen writes,

Here is a step toward a working definition. Digital history is an approach to examining and representing the past that works with the new communication technologies of the computer, the Internet network, and software systems. On one level, digital history is an open arena of scholarly production and communication, encompassing the development of new course materials and scholarly data collections. On another, it is a methodological approach framed by the hypertextual power of these technologies to make, define, query, and annotate associations in the human record of the past. To do digital history, then, is to create a framework, an ontology, through the technology for people to experience, read, and follow an argument about a historical problem.²⁶

Cohen goes on to note, '[d]igital history scholarship also encourages readers to investigate and form interpretive associations of their own. That might be the defining characteristic of the genre.'²⁷ These reflections reveal that digital technologies are transforming the scholarly enterprise of the humanities as we traditionally know it, with particular impact on the nature of historical inquiries of all kinds, including art historical inquiry, but the precise ways in which these changes will be enacted are still being determined.

At the heart of many digital humanities initiatives is undoubtedly the database. It is replacing a whole host of indexical literature that traditionally formed the infrastructure of scholarship, such as encyclopaedias, museum accession records and archival indices. Often, the organizational systems and categories of paper-based infrastructure are reproduced in digital media. 'Memory institutions' of a physical nature such as the state archive, the national library or the museum are inconceivable today without the database, which some have argued is not a merely a tool but constitutes a new genre unto itself that is challenging the

²⁴ Daniel J. Cohen *et al.*, 'Interchange: The Promise of Digital History', *Journal of American History*, 95(2), September 2008 [<http://www.journalofamericanhistory.org/issues/952/interchange/index.html> accessed 24.03.2012]. David Lazer *et al.*, 'Life in the network: the coming age of computational social science', *Science*, 323(5915), February 2009, 721-3.

²⁵ Susan Schreibman, Ray Siemens and John Unsworth, eds, *A Companion to Digital Humanities*, Oxford: Blackwell, 2004 [<http://www.digitalhumanities.org/companion/> accessed 24.03.2012].

²⁶ Cohen, 'Interchange'.

²⁷ Cohen, 'Interchange'.

role of narrative as the normative medium of scholarly discourse.²⁸ Databases, though, are built upon the ordering systems of the past and incorporate the underlying assumptions of those systems; consequently they embody the politics underlying the generation of knowledge in both the past and the present. Because Islamic art history depends heavily on memory institutions and the supporting scholarly infrastructure developed by various states as well as humanities disciplines, and because databases will likely be central to the future of Islamic art history, the first step to understanding the implications of the digital shift for the field is to consider more closely the nature of the archives it depends upon as they are digitally reincarnated.

The politics of the archive and its digital refigurings

At the core of any historical inquiry is the notion and practice of archiving. The way we archive strongly shapes what we can know and write about the past and consequently has a strong bearing on the writing of history and the formation of collective identities. Archiving, which in a broad sense can encompass all acts of collective and institutional memory-keeping, including museum collecting, has attracted considerable scholarly reflection in the general humanities in the past few decades, a prominent line of enquiry being the nature of collective institutionalized memory.²⁹ Another point of focus in this area of study is the politics of archiving, especially by state-sponsored public archives: the act of record keeping is frequently argued to be an exercise in authority over future social memory and social identity, one that can conceal as much as it reveals. The archival record is not viewed as a neutral record but as a political event in which what can be remembered is negotiated and asserted. As Hamilton, Harris and Reid write in the introduction to their book *Refiguring the Archive* '... archives are both documents of exclusion and monuments to particular configurations of power.'³⁰

Much of Islamic art history is arguably built upon conserved architecture and the collections of artefacts, manuscripts and archaeological evidence that are stored in libraries, archives, museums and private residences. Many of these collections were formed within eighteenth-, nineteenth- and early twentieth-century imperialist and neo-imperialist contexts. These collectively constitute the field's archives, along with subsequent twentieth and twenty-first century additions. These archives will underlie any future digital archives created for the field, but what configurations of power will they carry forward?

A few select examples demonstrate how closely the formation of Islamic art history's archives is tied to the histories of imperialism and its echoes. In 1861, the

²⁸ Ed Folsom, 'Database as Genre: The Epic Transformation of Archives', *PMLA*, 122(5), October 2007, 1571-9.

²⁹ Marlene Manoff, 'Theories of the Archive from Across the Disciplines portal', *Libraries and the Academy*, 4(1), January 2004, 9-25. Two highly influential works are Jacques Derrida, *Archive Fever: A Freudian Impression*, tr. Eric Prenowitz, Chicago: University of Chicago Press, 1996; and Michel Foucault, *The Archaeology of Knowledge*, tr. A.M. Sheridan Smith, London: Routledge, 1989 (orig. Paris 1969).

³⁰ Carolyn Hamilton *et al.*, eds, *Refiguring the Archive*, Cape Town: David Philip Publishers, 2002, 9.

Archaeological Survey of India was formed by the British colonial administration following the Great Rebellion of 1857 and the crackdown on Indian resistance to British colonial rule. It was during the post-rebellion period that the Victoria and Albert Museum's renowned collection of Mughal art was largely formed, following a substantial purchasing trip to India undertaken in 1879 by Caspar Purdon Clarke (1846-1911) and, in the same year, an important merger with the India Museum. This had been established in London in 1801, by the East India Company, and was a rich repository of diplomatic gifts from India to the Prince of Wales, and well as for the collections of Company officials and officers, acquired over the same period.³¹

Following the French occupation of Algeria in 1830, the French government established the Bibliothèque d'Alger in 1835 and the accompanying Musée-Bibliothèque d'Alger in 1838.³² Franco-Iranian diplomatic and commercial alliances formed to ward off British and Russian expansionism in Central Asia and the Middle East formed the backdrop to Qajar ruler Nasir al-Din Shah's granting of exclusive rights for the French to conduct archaeological investigations in Iran in 1895, and the subsequent unrestricted export of Iranian antiquities back to France.³³ Conditions like these set the stage for the influential exhibitions of Islamic art held by private collectors and amateurs in Paris in the late nineteenth century, such as the exhibition of Muslim art at the Palais des Champs-Élysées in 1893. Paris became an important hub for the emerging international market for Islamic art and the sales and donations of private collections of individuals like Albert Goupil (1840-84) and Georges Marteau (1858-1916) would lead to significant expansions of the Islamic art collections of the Louvre and the Bibliothèque Nationale.³⁴

International commercial art dealers, collectors and influential exhibitors in Paris, London and elsewhere depended on a supply of material from the Islamic world that rode on the waves of pre-Islamic antiquities flowing from the Middle East and South Asia to Europe. Art dealers like the Armenian-American Hagop Kevorkian (1872-1962), who privately financed excavations in Iran and formed a personal collection that eventually formed a central part of the Metropolitan Museum of Art's Islamic art collection, profited from an unregulated environment.

In the Caucasus and Central Asia, Russian military expansion preceded the amassing of collections that would form the basis of the Hermitage Museum's stunning Islamic art collections.³⁵ Even in the Middle East, the project of forming modern nation-states in the European mould and in line with the imperial world order of the late-nineteenth and early twentieth century prompted the sponsorship

³¹ Susan Stronge, 'Collecting Mughal Art at the Victoria and Albert Museum' in Vernoit, *Discovering Islamic Art*, 88. After the India Museum was dismantled, parts of its collections were also distributed to the British Museum (Partha Mitter, 'The Imperial Collections: Indian Art', in Malcolm Baker and Brenda Richardson, eds, *A Grand Design: The Art of the Victoria and Albert Museum*, London: V&A Publications, 1997, 222-9).

³² Nadia Erzini, 'Cultural Administration in French North Africa and the Growth of Islamic Art History', in Vernoit, *Discovering Islamic Art*, 73.

³³ See Abdi, 'Nationalism, Politics, and the Development of Archaeology in Iran', 54-5.

³⁴ See David J. Roxburgh, 'Au Bonheur des Amateurs: Collecting and Exhibiting Islamic Art, ca. 1890-1910', *Ars Orientalis*, 30, 2000, 9-38.

³⁵ J. Michael Rogers, 'The Collecting of Islamic Art in Nineteenth-Century Russia', in Vernoit, *Discovering Islamic Art*, 63-4.

of archival institutions like the Imperial Museum in Istanbul of the late Ottoman empire and the National Museum in Beirut in the post-Ottoman Lebanese republic, as well as initiatives like the French archaeological missions endorsed by the rulers of Qajar Iran.³⁶

However high-minded may have been the individual motivations of the early generation of private collectors, dealers, state-sponsored curators and other individuals who formed the archives upon which Islamic art history now rests,³⁷ the actions of these early contributors to the study of Islamic art were informed by political and economic relations that were being shaped by imperialist agendas. While the interdependencies between these political and economic forces and the archive-formation of Islamic art history is beginning to be described, there is considerable room to delve deeper into the ways in which the politics of imperialism have marked the discipline and its archives. Research into the nature of archives formed under colonial rule suggests imperialist and colonialist ideologies can imprint themselves in surprising ways on archives created in such contexts, subtly shaping the knowledge that is generated from them.³⁸ Though archiving practices can shift and may be refigured and reconstituted as political orders and archival technologies change, archival legacies can also be resilient, and need to be challenged.³⁹ When it comes to the discipline of Islamic art history, it remains an open question whether the archives formed within imperial contexts have been or will be significantly refigured in keeping with a non-imperialist ethos. Though the digital age has expanded the capacity to archive and widened access, this does not erase the politics of how these given archives were and are constituted.

Transitions to digital archives along with computational analytical methods are also political moments when the archive is refigured and reconstituted, moments spurred on by intertwined shifts in political order and technology. It is these moments of refiguration that expose the implicit order and embedded

³⁶ See Shaw, *Possessors and Possessed*; Watenpaugh, 'Museums and the Construction of National History'; Nasiri-Moghaddam, *L'archéologie française en Perse*; Bozdoğan and Necipoğlu, *History and Ideology*.

³⁷ For example, see the argument that German Orientalists worked to counter European exceptionalism and ultra-chauvinism presented in Suzanne Marchand, 'German Orientalism and the Decline of the West', *Proceedings of the American Philosophical Society*, 145(4), 2001, 465-73. Similarly, an argument that European Orientalists were often anti-Imperialists can be found in Robert Irwin, *Dangerous Knowledge: Orientalism and Its Discontents*, New York: Overlook Press, 2006.

³⁸ Historian Ann Stoler, for instance, has examined the archival practices of the nineteenth-century Dutch East Indies. By studying 'archival form' – that is, prose style, repetitions, rhetoric of persuasion, classification schemes and genres – Stoler examines the archive for what it can tell us about the archiver, rather than the peoples whose histories are being archived (Ann Stoler, *Along the Archival Grain: Epistemic Anxieties and Colonial Common Sense*, Princeton, NJ: Princeton University Press, 2010, 20). She also offers the poignant reminder that the 'pursuits of exploitation and enlightenment are not mutually exclusive but deeply entangled projects' (Stoler, *Along the Archival Grain*, 3).

³⁹ The case of South Africa in the post-apartheid regime period is particularly instructive. There, the stark difference between what the apartheid regime chose to archive and the requirements of a post-apartheid state was inescapable, leading to various efforts to reconceptualize the public archive, a key initiative being the development of oral archives to record black South African experiences of the apartheid regime to contrast with its written records. Hamilton *et al.*, *Refiguring the Archive*, 7.

questions of preceding archives and their future digital incarnations. Recent policies and funding initiatives in United Kingdom have shown how contemporary political discourse can weave itself into the practice of archiving in the digital age. In 2004, the UK government asked for 'strategically important' higher education subjects to be identified by the Higher Education Funding Council for England (HEFCE) and the following year £350 million of government money was pledged to reinforce those designated areas.⁴⁰ In 2007, Islamic studies was identified as a strategic area, a circumstance which spurred the Joint Information Systems Committee (JISC) to launch the DigIslam project aimed at defining the user requirements for digitized resources in the field of Islamic studies, including (as a minor subfield) Islamic art history.⁴¹ Significant archival digitization initiatives were subsequently funded, such as the British Library's Islamic studies PhD theses project,⁴² an online catalogue of Oxford and Cambridge Islamic Manuscripts,⁴³ the University of Birmingham's Virtual Manuscript Room,⁴⁴ the Wellcome Arabic Manuscript Cataloguing Project,⁴⁵ and the Yale-SOAS Islamic Manuscript Gallery.⁴⁶

It is clear that the upsurge in governmental funding for an Islamic studies digital shift coincided with the UK government's rising perceptions of Islamic terrorism as a major security threat following the attacks on New York on 11 September 2001 and the London bombings on 7 July 2005. This much is acknowledged in the June 2008 report 'International Approaches to Islamic Studies in Higher Education', submitted to the HEFCE, which states 'The development of Islamic Studies continues to be influenced by the historical context within which it finds itself. With the backdrop of established Muslim communities in the UK, and in a post-9/11 and 7/7 climate, disciplinary approaches to Islamic Studies are evolving and expanding.'⁴⁷

⁴⁰ Robin Simcox, *A Degree of Influence: The Funding of Strategically Important Subjects in UK Universities*, The Centre for Social Cohesion, 2009, 16-17 [http://www.socialcohesion.co.uk/files/1238334646_1.pdf accessed 24.03.2012].

⁴¹ JISC and University of Exeter, *DigIslam: Review of User Requirements for Digitised Resources in Islamic Studies*, May 2008, 5 [<http://projects.exeter.ac.uk/digiIslam/documents/DigiIslamReport.pdf> accessed 24.03.2012].

⁴² JISC Digital Islam: Theses on EThOS [<http://www.jisc.ac.uk/whatwedo/programmes/digitisation/islamdigi/islamthesis.aspx> accessed 24.03.2012].

⁴³ JISC Oxford and Cambridge Islamic manuscripts catalogue online [<http://www.jisc.ac.uk/whatwedo/programmes/digitisation/islamdigi/islamoxbridge.aspx>. <http://www.fihrist.org.uk/> accessed 24.03.2012].

⁴⁴ Virtual Manuscript Room [<http://vmr.bham.ac.uk/> accessed 24.03.2012].

⁴⁵ Wellcome Arabic Manuscripts [<http://library.wellcome.ac.uk/arabicproject.html> accessed 24.03.2012].

⁴⁶ Yale-SOAS Islamic Manuscript Gallery (YS-IMG) [<http://www.soas.ac.uk/ysimg/>. http://digital.info.soas.ac.uk/cgi/c/Islamic_manuscripts_gallery/Yale-SOAS_Islamic_Manuscripts_Gallery_Homepage accessed 24.03.2012].

⁴⁷ Subject Centre for Languages, Linguistics and Area Studies and Subject Centre for Philosophical and Religious Studies, *International Approaches to Islamic Studies in Higher Education*, June 2008, 11 [http://eprints.soton.ac.uk/172443/1/rd07_08.pdf accessed 24.03.2012]. For a discussion of the politics of the patronage of Islamic world studies in the US see Joel Beinin, 'The New McCarthyism: Policing Thought about the Middle East' in Beshara Doumani, ed., *Academic Freedom after 9/11*, Cambridge, MA: Zone Press, 2006, 237-266; John J. Miller, 'Clash of Cultures: How donors can increase understanding of the Middle East', *Philanthropy Magazine*, 6 August 2007

This is not to say that all of the JISC initiatives are imbued with the rhetoric of anti-terrorism, or that the end results are not positive or useful in different ways. But it is important to recognize that the attraction of significant state funds to facilitate the digital shift in Islamic studies in this case depended on its being arguably in the government's strategic interest. For some, the exertion of governmental influence over Islamic studies in general and by extension its archives is a matter of political necessity and national security. Robin Simcox's 2009 report for the Centre for Social Cohesion worries greatly about the influence Middle Eastern and Islamic states have over British Islamic studies, suggesting the objectivity of British institutions is at risk.⁴⁸ Not surprisingly, the charge of bias has been forcefully denied.⁴⁹ In any case, this present-day interest in the sponsorship of Islamic studies and the UK state's encouragement of its digital shift highlights the extent to which scholarship and its related archives are contested domains that are inextricable from their socio-political contexts.

The capacity and desire to archive digitally is certainly not limited to European and American academic institutions. The non-profit Al-Muhaddith project has designed its own custom software to read the canonical Sunni texts of hadith, fiqh, Qur'an commentary and other texts it has digitized, many in searchable Arabic.⁵⁰ Similarly, the Ahlul Bayt Digital Islamic Library Project has assembled canonical Twelver Shia texts.⁵¹ These initiatives have placed online numerous religious texts that reflect the doctrinal orientations of their creators, and they remind us that the priorities of scholars and of religious communities can vary and that these priorities are reflected in what each group chooses to archive, and how.

Assumptions of neutrality

Just as it was once common to think of archives and their records as value neutral, it is still relatively common to assume that technologies are value neutral and that the aims driving their development are automatically aligned with their ends. Some have argued that this is an extension of the Enlightenment notion that reason and by extension technologies are value neutral.⁵² However, technological tools are generally developed in response to certain problems and agendas. As a result their design and maximum functionality is tied to their original aim. Tools also emanate from a cultural context. Their aims reveal what the toolmakers conceptualized as a problem, and what a desirable solution looked like. Thus, technological tools carry

[http://www.philanthropyroundtable.org/topic/excellence_in_philanthropy/clash_of_cultures accessed 24.03.2012].

⁴⁸ Simcox, *A Degree of Influence*, 14-5.

⁴⁹ D.D. Guttenplan, 'Embarrassing Liaisons at British Universities', *The New York Times*, 20 March 2011, [<http://www.nytimes.com/2011/03/21/education/21iht-educLede21.html> accessed 24.03.2012].

⁵⁰ Al-Muhaddith [<http://www.muhammad.org/> accessed 24.03.2012]. Niels Brügger, *Web History*, New York: Peter Lang, 2010, 118.

⁵¹ Ahlul Bayt Digital Islamic Library Project [<http://www.al-islam.org/> accessed 24.03.2012]. Gary R. Bunt, *Virtually Islamic: computer-mediated communication and cyber Islamic environments*, Cardiff: University of Wales Press, 2000, 30.

⁵² Andrew Feenberg, *Questioning Technology*, London: Routledge, 2002, 1.

a number of embedded assumptions, which in turn can be scrutinized for the aims and cultural values that gave rise to them and that they reinforce. Put another way, they embody a set of cultural values.⁵³ To give just one example, recent debates over privacy and the internet have put the values of individual privacy in contest with the institutional values of surveillance, security and copyright protection: the tool in this case is the internet, and the kind of internet that emerges from this debate will depend upon the set of values that eventually prevail.⁵⁴

Undoubtedly, tools are also adapted for different ends in ways unimagined by their designers. The unexpected reuses of tools do not erase their embodied values but merely offer different contexts in which to examine the manifestation of values. Computer scientist, artist and theorist of the digital age Jaron Lanier cautions that the design decisions of software engineers need to be thoroughly examined because they will likely freeze into place the direction of future software developments – and the behaviours of users – in a process known as ‘lock-in’.⁵⁵ A relevant and paradigmatic example of this is computing script type: software, the internet and search engines were initially built around the use of the Roman script; non-Roman scripts like Arabic were only belatedly taken into account.

The notion of embodied values in technology has important implications for the field of Islamic art history as the digital shift beckons, especially if the field reacts with an adaptive approach. Differing aims and values become especially apparent for those who do not design their own technologies and seek to adapt existing ones to their own ends.⁵⁶ The perspectives and values of programmers, digital archivists and librarians, museum officials and curators, digital humanists, historians of European, American and East Asian art, Islamic studies scholars and

⁵³ Andrew Feenberg, ‘Can Technology Incorporate Values? Marcuse’s Answer to the Question of the Age’, conference paper delivered at *The Legacy of Herbert Marcuse*, University of California – Berkeley, 7 November 1998; Mary Flanagan, Daniel C. Howe and Helen Nissenbaum, ‘16 - Embodying Values in Technology: Theory and Practice’, in Jeroen van den Hoven, ed., *Information Technology and Moral Philosophy*, Cambridge: Cambridge University Press, 2008, 322-53.

⁵⁴ Saul X. Levmore and Martha Craven Nussbaum, *The offensive Internet: privacy, speech, and reputation*, Cambridge, MA: Harvard University Press, 2011.

⁵⁵ Jaron Lanier, *You are not a Gadget: A Manifesto*, New York: Alfred A. Knopf, 2010, 7.

⁵⁶ The case of urban planners’ use of Graphic Information Systems (GIS) technology is illuminating. Mayall and Hall in their article ‘Generalizing GIS’ point out the paradoxical nature of the urban planning profession’s use of spatial technologies such as GIS (Kevin Mayall and G. Brent Hall, ‘Generalizing GIS: Development of Spatial Grammars for Landscape Planning’, conference paper delivered at *Symposium on Geospatial Theory, Processing and Applications*, Ottawa, 2002; Kevin Mayall and G. Brent Hall, ‘Landscape Grammar 1: Spatial Grammar Theory and Landscape Planning’, *Environment and Planning B: Planning and Design*, 32, 2006, 895-920). Planning authorities, they argue, need to make generalized statements about the aesthetic character of a landscape in order to help them shape land use, whereas GIS tools are designed to create spatialized inventories of specific existing and proposed objects. For instance, planners might need to keep track of neighbourhoods with distinctive heritage features but their tools are best suited to tracking things like the number of fire hydrants in the neighbourhood. Planners are caught in an adaptive relationship with a technology that has not been tailored for them, is prematurely precise and does not align with their aims. Mayall and Hall’s solution is to propose a landscape grammar that mediates between the highly specific nature of GIS software and the more generalized aims of planners. New software would need to be designed to facilitate this translative process. Thus, software design becomes the place where goals and aims are articulated and negotiated.

others will shape the emerging digital environment that Islamic art historians will use – but to what extent will this environment align with the values and aims of individual Islamic art historians?

Many circumstances that underline the importance of Islamic art historians' engagement with the digital turn are easily brought to mind. For example, programmers may assume the Gregorian calendrical system is the best way of marking time, with obvious implications for material and records dated in other systems. Museum institutions' values concerning ownership of their collections and their digital reproductions already have a profound impact on what Islamic art historians are able to access, analyze computationally and publish. Systems like ARTstor were designed first and foremost around European and American art, and are therefore able to deal most effectively with the kinds of evidence available for its study, such as searching by artists' names. Manuscript digitization and database initiatives led by Islamic studies scholars who are not art historians may or may not make transparent the presence of images within the manuscripts. The list goes on.

Though Islamic art history's digital transition is an uncertain prospect, its realization, if it is an uncritical one, runs the risk of reproducing and 'locking in' tendencies that have dominated in the past: these include the use of organizational schema like dynastic labels or post-1918 nation-state geography, the use of political contextualization as an interpretive strategy, the tastes of nineteenth- and early twentieth-century art dealers and collectors, the privileging of the visual cultures of Arabic- and Persian-speaking regions, or of the origins of a given form over its afterlife, the separation of image and text, and the exaltation of textual sources as the principal form of evidence. In broader terms, echoes of the values arising from the field's ties to the imperial and colonial projects of the nineteenth and early twentieth centuries may find themselves resonating in twenty-first century digital archives and technologies if left unexamined. As a consequence, scholars interested in the histories of the visual cultures of the Islamic world and its digital shift are now faced with the question of identifying which scholarly values and priorities, and more broadly, which larger social values they wish to incorporate into facilitating technologies.

Computational analysis and collaboration

As with traditional archives, the structure of the digital archive is informed by the kinds of analytical queries it is designed to serve. Conversely, those analytical queries are delimited by the structure of the digital archive. The two are inextricably linked. Just as a work of architecture defines the kinds of movement possible throughout space, so too does the architecture of a database define the questions that can and cannot be asked. Though building digital archives is an essential first step in the digital transition, it is a step that must be preceded by careful contemplation of the kinds of computational analyses to be performed. Sceptics will wonder what value computational analysis will bring, and in truth the rewards are not fully predictable. Digital tools do not appear to supplant traditional modes of reading and viewing but they do seem to be able to enhance the kinds and volumes of reading and viewings that can be done. They lend themselves to

quantitative and statistical modes of historical inquiry using large-scale data-sets and offer alternate ways of exploring and knowing about a subject.

Consider for example the Stanford University-based project Mapping the Republic of Letters, which visualizes the flow of letters between Enlightenment intellectuals in Europe and America in the seventeenth and eighteenth centuries.⁵⁷ Built upon a pre-existing Electronic Enlightenment (EE) database at Oxford, which consists of more than 55,000 scanned and searchable letters, the project maps the dynamic exchange of ideas, allowing researchers to define the geographic extents of the influence of a thinker like Voltaire and his interactions with different writers. Voltaire's influence is thus understood in visual and spatial terms and with greater quantitative precision.⁵⁸ One observation arising from the visualization thus enabled is that the bulk of Voltaire's letters circulated within a radius of 500 km, indicating his sphere of influence was perhaps smaller than otherwise thought.⁵⁹ It is easy to imagine that these strategies of visualizing networks of influence could be applied in the field of Islamic art history to examine the flows of verbal, visual and spatial ideas, but this would first require the appropriate digital infrastructure to be put in place.

Computational text analysis is the centrepiece of digital humanities methods and can be used to illuminate patterns in word frequency, phrasing, sentence structures and semantic relationships, as well as providing statistical overviews of the structure and themes of a text. Text analysis tools like Voyant,⁶⁰ Wordseer⁶¹ or the suite of tools at Text Analysis Portal for Research (TAPoR)⁶² and Metadata Offer New Knowledge (MONK)⁶³ all provide computational methods of reading and analyzing texts. For visual culture scholars such tools can be invaluable for establishing the historical vocabulary employed for visual culture, locating far flung references to visual culture, understanding influential social networks and determining the geographies and sites discussed, to name just a few benefits.⁶⁴ In

⁵⁷ Mapping the Republic of Letters [<https://republicofletters.stanford.edu/> accessed 24.03.2012].

⁵⁸ Electronic Enlightenment [<http://www.e-enlightenment.com/> accessed 24.03.2012].

⁵⁹ Bugei Nyaosi, 'Voltaire's Correspondences: Utilizing Visualization in the Mapping the Republic of Letters Project', *Spatial History Lab*, 1 September 2010 [<http://www.stanford.edu/group/spatialhistory/cgi-bin/site/pub.php?id=71> accessed 24.03.2012].

⁶⁰ Voyant [<http://voyant-tools.org/> accessed 24.03.2012].

⁶¹ Wordseer [<http://wordseer.berkeley.edu/> accessed 24.30.2012]. Wordseer has been used to compare the usage of the word 'love' in all of Shakespeare's tragedies and comedies: see Aditi Muralidharan, 'WordSeer: "love" in Shakespeare's tragedies and comedies', *Text Mining and the Digital Humanities*, 15 December 2011 [<http://mininghumanities.com/2011/12/15/wordseer-compares-love-in-tragedies-and-comedies/> accessed 24.03.2012].

⁶² Text Analysis Portal for Research [<http://portal.tapor.ca/portal/portal> accessed 24.03.2012]. TAPoR provides a tool - TAPoRwarePlainDateFinder - that isolates dates and chronological information in texts: TAPoRwarePlainDateFinder [<http://tada.mcmaster.ca/Main/TAPoRwarePlainDateFinder> accessed 24.03.2012].

⁶³ Metadata Offer New Knowledge [<http://www.monkproject.org/> accessed 24.03.2012].

⁶⁴ Meanwhile, in the commercial and military worlds, sophisticated data-mining tools are employed to scan mass amounts of data in order to discern thought patterns and behaviours, a field known as predictive analytics: Matt Adams, 'Predictive Analytics for the Retail Industry', *SQL Server Technical Article*, May 2008 [<http://www.microsoft.com/sqlserver/en/us/solutions-technologies/business-intelligence/data-mining.aspx> accessed 24.03.2012].

the sciences, computational text analysis is already being used to keep track of the content of the scholarly publications available worldwide.⁶⁵

Computational textual analysis tools also allow for the mapping of large-scale scholarly and public conversations. Viégas, Wattenberg and Kushal have shown how conversations and shifts in ideas can be tracked in Wikipedia creating what they call history flows.⁶⁶ They are able to visualize the debate about different entries such as 'Islam' and discern geographic tendencies and chronological developments in the conversation.⁶⁷ Were such tools to be applied to the study of Islamic art and architecture, the shape of scholarly discourse, thematic interests and absences across place and time would become more apparent. Such visualizations might be able to clarify with precision questions such as which regions are the focus of Islamic art history, which topics interest scholars in different regions, how scholarly conversations have shifted over time, which topics are most intensely debated and which topics and regions are understudied.

Computational visual and spatial analysis tools of a non-verbal variety are growing in sophistication and becoming increasingly mainstream, one high-profile example being the face recognition software employed in video editing and photo album software and social media.⁶⁸ Shapes, colours and even three-dimensional forms can be scanned across large datasets.⁶⁹ Various computer scientists are experimenting with computational approaches to the stylistic analysis of paintings, a field called stylometrics.⁷⁰ It is conceivable that stylometry could be used to study the evolution of Arabic calligraphy, potentially permitting a very precise understanding of how the script evolved across place, time, texts and media, overlapping no doubt with the work of digital philology projects like Corpus

⁶⁵ Soumya Raychaudhuri, *Computational Text Analysis: For Functional Genomics and Bioinformatics*, Oxford: Oxford University Press, 2006.

⁶⁶ Fernanda B. Viégas, Martin Wattenberg and Dave Kushal, 'Studying cooperation and conflict between authors with history flow visualizations', *Proceedings of the SIGCHI conference on Human factors in computing systems*, 24-29 April 2004, Vienna, 575-82 [doi>10.1145/985692.985765].

⁶⁷ History flow visualization of 'Islam' from Wikipedia
[http://www.research.ibm.com/visual/projects/history_flow/islam1.htm accessed 24/03.2012]

⁶⁸ Stefan R ger, *Multimedia Information Retrieval: Synthesis Lectures on Information Concepts, Retrieval and Services*, vol. 1, San Rafael, CA: Morgan and Claypool, 2009

[<http://www.morganclaypool.com/doi/abs/10.2200/S00244ED1V01Y200912ICR010> accessed 24.03.2012].

⁶⁹ For example, the National Library of Australia allows one to search its photographic collection of 18,500 images by selecting from a colour palette: National Library of Australia [<http://1104.nla.gov.au/> accessed 24.03.2012]. The Hermitage Museum allows searching of its digitized images not only by colour but also by where colour is used in an image; that is, one can identify all images that use a particular blue in the top right corner of an image: Hermitage Museum

[<http://www.hermitagemuseum.org/cgi-bin/db2www/qbicColor.mac/qbic?sellLang=English> accessed 24.03.2012].

⁷⁰ J. Li *et al.*, 'Rhythmic Brushstrokes Distinguish van Gogh from His Contemporaries: Findings via Automated Brushstroke Extraction', *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 99, 1-17; James M. Hughes, Daniel J. Graham, and Daniel N. Rockmore, 'Stylometrics of artwork: uses and limitations', *SPIE*, 7531, 4 February 2010, 75310C-75310C-15 [DOI: 10.1117/12.838849 accessed 24.03.2012]; R.P. Tieta Antaresti and A.M. Arymurthy, 'Image Feature Extraction and Recognition of Abstractionism and Realism Style of Indonesian Paintings', in *2010 Second International Conference on Advances in Computing, Control and Telecommunication Technologies (ACT)*, December 2010, 149-152.

Coranicum, an ambitious long-term German project that aims to create a database for the entire corpus of early Qur'anic and related pre-Islamic texts.⁷¹ Epigraphic analysis is also highly suited to current digital humanities methodologies. It can be imagined that a comprehensive database of epigraphy could be subjected to textual and spatial analysis to reveal word patterns and variations across time and space.

The real power of computational analysis, however, lies in the correlations it can expose across multiple media — text, image and video — as well as space and time. Simply put, the greatest promise lies in being able to search and analyze across multiple databases, but for this to happen effective ways of correlating different databases and data architectures are needed, as are shared standards.⁷² Without effective interactive interfaces to access, analyze and visualize data, patterns remain incomprehensible. The need to design such tools for large-scale humanities and visual cultural analysis is giving rise to a field that Lev Manovitch has termed cultural analytics or visual analytics. As it was described in a recent call for papers, '[t]he goal is to get beyond the notion that information exists independently of visual presentation, and to rethink visualization as an integrated analytical method in humanities scholarship'.⁷³ As Islamic art historians must face the challenge of thinking about how data should be archived to best suit their needs, they also need to consider how it should be accessed and visualized. This is not simply a technical design problem but a historiographical one requiring reflection on the kinds of inquiries that are to be made.

In the meantime, the relationship between scholarly and public discourse is being renegotiated, with new kinds of exchanges and collaborations becoming possible. Those on the forefront of the digital shift in Islamic studies have recognized that collaborative digital research spaces are an important end goal. Archnet is built around the concept of creating common workspaces for its

⁷¹ Corpus Coranicum [<http://koran.bbaw.de/> accessed 24.03.2012].

⁷² CADD and GIS software enable searching and correlations based on object, place and geography, but the archives need to include three-dimensional, satellite and map data. Only when combined with statistical analyses can patterns across large datasets be discerned. A UNESCO project on caravanserais, which is part of a larger study of Silk Road history, attempts to use GIS software to spatialise caravanserai development across Asia: see The Unesco Web Site on Caravanserais [<http://www.unesco.org/culture/dialogue/eastwest/caravan/page1.htm> accessed 24.03.2012]. If fully realised and made widely accessible the project would be a vital example of how spatial analysis can be applied to the field of Islamic art history, and would complement the intriguing exploratory work on the applicability of GIS to the field being undertaken by Japanese scholars (Atsuyuki Okabe, ed., *Islamic Area Studies with Geographical Information Systems*, London: RoutledgeCurzon, 2004). Another interesting model is The Digital Archaeological Atlas of the Holy Land, which integrates into a single interactive web page archaeological sites and objects found in modern Israel, Palestine, Jordan, southern Lebanon, Syria and the Sinai Peninsula from pre-history to the twentieth century including Islamic periods (The Digital Archaeological Atlas of the Holy Land [<http://daahl.ucsd.edu/DAAHL/> accessed 24.03.2011]).

⁷³ See the call for papers for *humanities+digital visual interpretations conference 2010, Aesthetics, Methods, and Critiques of Information Visualization in the Humanities, Arts, and Social Sciences*, 20-22 May 2010, at Massachusetts Institute of Technology [<http://hyperstudio.mit.edu/events/> accessed 24.03.2012]. In text analysis, data visualization explorations have given rise to word clouds, word trees and many other forms. IBM's Many Eyes website offers an introduction to data visualization techniques and even allows for data to be uploaded in order to use the visualization tools (Many Eyes [<http://www-958.ibm.com/software/data/cognos/manyeyes/> accessed 24.03.2012]).

members. The *Shahnama* project aims to create collaborative online tools, and UCLA's Near Eastern Manuscripts: Caro Minasian Collection Digitization Project aims to develop a virtual research environment 'to manipulate, annotate, transcribe, and share manuscripts and information about these manuscripts in an online environment ... and to capture the results of these scholarly activities as new data records, with appropriate metadata for the maintenance, exchange, and preservation of this scholarship.'⁷⁴ Projects like the Megalithic portal, which maps the world's prehistoric sites with an accompanying archive of GPS coordinates and photographs, are driven not by professional academics but by the interested public. Such projects likely exceed the scope of many academic projects and point to ways in which partnering with an informed public can expand the scale of scholarly inquiry in cost-effective ways.⁷⁵

The particularities of visual culture research and Islamic art history

What, then, are the particularities of Islamic art historical needs when it comes to the digital shift? Which unique kinds of information, which ways of organizing information, which unique kinds of analysis and querying are typically performed? One common challenge for Islamic studies scholars in general is the creation of networked digital archives whose texts, particularly Arabic script texts, are searchable.⁷⁶ As the JISC sponsored Yale-SOAS Islamic Manuscript Gallery (YS-IMG) Project coordinators have highlighted a key challenge facing the digitization of Arabic script manuscripts: transcription into machine-readable Arabic script.⁷⁷ Optical Character Recognition (OCR) technologies are still not up to the task and manual solutions are potentially too resource-intensive, not to mention the immense scholarly effort necessary for the production of critical editions. Unless manuscript texts can become searchable on a significant scale, textual computational analysis – a core dimension of digital humanities research – is simply not possible. A less severe problem is the plurality of romanizing transliteration systems currently in use. Words, names and titles and placenames when transliterated inconsistently become difficult to correlate: however, this problem could be addressed, as indeed it was in Early English Books Online,

⁷⁴ Near Eastern Manuscripts: Caro Minasian Collection Digitization Project [http://unitproj1.library.ucla.edu/dlib/minasian/project.cfm accessed 24.03.2012].

⁷⁵ The Megalithic Portal and Megalith Map [http://www.megalithic.co.uk/modules.php?op=modload&name=FAQ&file=index&myfaq=yes&id_cat=1&categories=About+this+website accessed 24.03.2012].

⁷⁶ Husni Al-Muhtaseb and Rami Qahwaji, 'Arabic Optical Character Recognition: Recent Trends and Future Directions', in Rami Qahwaji, Roger Green, and Evor L. Hines, eds, *Applied Signal and Image Processing: Multidisciplinary Advancements*, Hershey, PA: IGI Global, 2011, 324-46 [doi:10.4018/978-1-60960-477-6.ch019 accessed 07.09.11]; S.A. Sattar, S. Haque, M.K. Pathan, and Q. Gee, 'Implementation Challenges for Nastaliq Character Recognition', 2008 [http://eprints.ecs.soton.ac.uk/16510/1/ASattar_85.doc accessed 24.03.2012].

⁷⁷ Yale-SOAS Islamic Manuscript Gallery (YS-IMG) Project [http://www.soas.ac.uk/ysimg/ accessed 24.03.2012].

through the use of a variety of thesaurus-like databases and custom developed tools.⁷⁸

Within the realm of manuscript studies, another point for consideration would be that for the most part manuscript digitization efforts tend to be logocentric, as opposed to treating manuscripts as the visuo-textual (and tactile) documents that they are. Visual culture researchers need to find a way to impress their needs and interests onto digitization efforts. The May 2008 JISC report 'DigIslam: Review of User Requirements for Digitised Resources in Islamic Studies' only makes brief mention of the field of Islamic art and architectural history, noting that only 18.4 % of survey respondents thought it important to digitize related resources.⁷⁹ No attempt was made to consider the particular needs of Islamic art history, despite the report's mandate to determine the user requirements for digitized resources for researchers and teachers in the field of Islamic studies, in which Islamic art and architecture is included as a sub-field.

There are various examples of the possible consequences for digital resources if art historical voices continue to remain silent. Harvard's Islamic Heritage Project, for example, does not allow one to browse for illustrations, though it features a *Shahnama* illustration on its website and indicates that the project includes 'copies of artistic value, including items with miniatures or other illustrations, illuminations, exceptional calligraphy, or bindings.'⁸⁰ This phrase raises a major question: what exactly constitutes artistic value, who decides this, and to what extent are the viewpoints of one of the Islamic Heritage Project's key patrons, Prince Alwaleed Bin Talal, being considered? Similarly, UCLA's Caro Minasian Collection Digitization Project pays little attention to illustrations. The Princeton Digital Library of Islamic Manuscripts identifies illustrated and illuminated manuscripts, but does not classify one scientific manuscript with botanical illustrations as an illustrated manuscript.⁸¹ A distinction between scientific illustration and other kinds of illustration is thus taken for granted, though histories of Arabic manuscript-painting have long included scientific illustrations. The Walters Islamic Manuscript Digital Project provides no simple interface to access the illustrations in its manuscripts; however, its data, which is open, is structured to identify illustrations using the field 'form' under 'the larger category 'decoration'. Fortunately, the data structure and policy of open data access allow for a third party to design their own means of interfacing with the

⁷⁸ Martin Mueller, 'VosPos: A project for Virtual Orthographic Standardization and Part of Speech Tagging of Early Modern English texts', Draft Report, 20 November 2006 [<http://panini.northwestern.edu/mmueller/vospos.pdf> accessed 24.03.2012].

⁷⁹ JISC DigIslam: Review of User Requirements for Digitised Resources in Islamic Studies, May 2008 [<http://projects.exeter.ac.uk/digiIslam/documents/DigiIslamReport.pdf> accessed 24.03.2012].

⁸⁰ Islamic Heritage Project: Scope and Content [<http://ocp.hul.harvard.edu/ihp/scope.html> accessed 24.03.2012].

⁸¹ For example, Garrett no. 583H, Princeton University Library, Department of Rare Books and Special Collections. Manuscripts Collection, Islamic Manuscripts [<http://arks.princeton.edu/ark:/88435/2801pg40q> accessed 24.03.2012]

manuscripts and their illustrations.⁸² In the case of manuscripts, visual cultural historians might also be interested in script styles, the presence of illumination, margin designs, text layouts and division strategies, paper, bindings, or the distribution of images throughout texts, to name but a few criteria. Yet, the possibility that many of the manuscript digitization projects underway could accommodate such inquiries seems disappointingly low.

However, the Cambridge *Shahnama* project offers a very interesting example of how visual cultural research priorities can usefully shape data collection strategies and technological design. The project has established that image-text relations are an important topic of inquiry, which is not necessarily the assumption made by earlier scholars of *Shahnama* paintings. As a result, attention is paid to break-lines — the points where the text breaks in deference to the image and then resumes — and great effort has been made to correlate the images with their narratives despite the instability of the *Shahnama* text.⁸³ It remains to be seen how flexible the project will be given that a digital project cannot be all things to all people, resources are not infinite and lines have to be drawn somewhere. The challenge, then, is to create a sufficiently flexible foundation upon which other initiatives with different aims and computational analytical tools can be built. Can the *Shahnama* project then be expanded in the future to facilitate computational analysis of, for example, the movement of manuscripts and compositional schemes across space and time, the gradual morphing of the text body, the frequency of female representation, the recurrence of multimodal metaphors, or shifts in colour palettes?

When it comes to architectural and urban history the demands placed upon digital resources are even more complex. For example, photographs are an important part of architectural research, but understanding the relationship that a set of photographs bear to the sites they capture is essential. Photo-spatial applications like Hiroya Tanaka's PHOTOWALKER⁸⁴, Microsoft's Photosynth⁸⁵ and Google's Panoramio⁸⁶ offer examples of technologies that are potentially very useful to the field if the particular concerns of historians of visual culture can be incorporated. The technologies archive and present photographs in a way that make clear the camera's spatial relationship to the subject. One can switch from a photograph that establishes a site's context to one of a detail of that shot, with the relationships between the two images remaining obvious because of the interface design. One can also see in three dimensions the sum of various photographers' viewpoints. However, these technologies do not currently allow for photographs to be stored, sorted and compared chronologically. Such features would, if properly

⁸² The Walters Islamic Manuscript Digital Project [http://www.thedigitalwalters.org/Data/WaltersManuscripts/html/W593/description.html accessed 24.03.2012].

⁸³ *Shahnama* Project: About the Database [http://shahnama.caret.cam.ac.uk/new/jnama/page/about-data.html accessed 24.03.2012].

⁸⁴ PHOTOWALKER [http://web.sfc.keio.ac.jp/~htanaka/earthwalker/photowalker/ accessed 24.03.2012].

⁸⁵ Photosynth [http://photosynth.net/ accessed 24.03.2012].

⁸⁶ Panoramio [http://www.panoramio.com/ accessed 24.03.2012].

developed, allow an understanding of the shifts in the subjects photographed over time, the photographic vantage points, and the representational choices made by photographers. For example, with this technology, comparisons between the photographic proclivities of tourists and those of scholars, or those of scholars from different regions and disciplines, would be possible, allowing scrutiny of the assumptions embedded in photographic practice. Dynamic chronological filtering, then, is an essential feature that visual culture researchers require of technologies such as photo-spatial applications. Such cases highlight the problem with adaptive approaches to technologies that are built with the concerns of other practices foremost; they can only offer incomplete solutions to scholarly problems.

In terms of architectural historical research, databases of plans that are comparable to one another would be extremely useful for conducting statistical analyses of spatial usage and proportions. Similarly, databases of photographs and three-dimensional models could be developed with visual search functions to facilitate morphological studies and analyses. Much historical architecture of the Islamic world employs architectural epigraphy, leaving open the question of how the pertinent information could be archived in a way that would allow large-scale analysis of relationships between placement and content.

Finally, a major problem faced by Islamic studies, which also rings true for Islamic art history, is the division of scholarly and general discourse by language, including European languages such as English, French, German, Spanish, and Russian as well as the Islamic-world languages of Arabic, Persian, Urdu, Turkish, *et al.* Laila Sakr has attempted to address the separation of contemporary discourse concerning the Middle East that is conducted in Arabic from that in English by developing an innovative new web archive called *R-Shief* that tracks conversation topics on Twitter in English and Arabic and allows them to be compared.⁸⁷ The technology allows large-scale conversations across multiple languages, social media and the internet to be visualized and studied and has proven to be extraordinarily important to understanding the course of the recent citizen resistance movements of the Arab Spring. The R-Shief website project points to means by which technological tools can integrate large-scale public discourse and multiple languages.

Vexing problems

Difficult challenges accompany the digital shift, both technical and procedural. The problem of how to draw connections across multiple kinds of databases and media is a vexing and vital area of research for computer scientists concerned with database ontologies, which are means of correlating different databases with

⁸⁷ Laila Sakr, 'On Implementing the Digital Form: an Arabic-English Web-based Archive', conference paper delivered at *The Past's Digital Presence: Database, Archive and Knowledge Work in the Humanities*, 22 January 2010 [<http://digitalhumanities.yale.edu/pdp/2010/01/22/on-implementing-the-digital-form-an-arabic-english-web-based-archive/> accessed 24.03.2012]; R-Shief [<http://www.r-shief.org/> accessed 24.03.2012].

different data structures.⁸⁸ Another common problem that visual culture researchers share across a number of different fields is the question of how to collect and relate data in multiple media (audio, spatial, textual, visual, video) and multiple formats. How does one meaningfully relate a video file of a building to a scholarly article on the building and to traveller's accounts, along with photographs and paintings?⁸⁹

Another key issue is copyright restrictions. If permissions and access to proprietary databases and their contents, as well as archives associated with private collections, are not possible, then large-scale cross-database queries are difficult if not impossible to realize. The Walters Art Museum approach, for example, is admirably liberal. The Walters collection of digitized Islamic manuscripts and accompanying data is openly available and has been uploaded to the social media image site Flickr, practices which in turn allow outside developers to develop custom applications that access their database.⁹⁰ It is inescapable that open access is necessary for the full rewards of computational analysis to be realized.

In the larger scheme of things, Islamic studies is relatively small and Islamic art history is even smaller. Yet, if one takes the various attempts to digitize Islamic manuscripts across the world as a case in point, efforts to harness the possibilities afforded by the digital shift appear relatively uncoordinated, resulting in a plurality of viewing programs, digitization standards and approaches. A 2007 roundtable of key Islamic manuscript curators from Europe's major centres revealed that developing coordinated approaches and common standards for meta-data within the field of Islamic art history were not yet a priority; the emphasis of the gathering was to keep abreast of the diverse digitization initiatives currently underway, rather than harmonize them.⁹¹ No collective standards for comparable efforts in other fields of Islamic visual culture studies appear to be emerging either. The challenge for Islamic art historians, then, is to arrive at a consensus within the field on strategies, both adaptive and purpose-built, to deal with the digital shift. Ideally these should coordinate with the rest of the field of Islamic studies, and the larger spheres of art history and the humanities, as well as communicating the particular needs and interests of Islamic world visual culture scholars.

⁸⁸ Tom Gruber, 'Ontology', in Ling Liu and M. Tamer Özsu, eds, *Encyclopedia of Database Systems*, Berlin: Springer, 2009 [<http://tomgruber.org/writing/ontology-in-encyclopedia-of-dbs.pdf> accessed 24.03.2012].

⁸⁹ Jim Steiner and Joseph Mauro, 'Multimedia Databases Multi Terabyte Performance', 2003 [download.oracle.com/owsf_2003/40121_steiner_0902.doc accessed 24.03.2012].

⁹⁰ Walters Art Museum Illuminated Manuscripts photostream [<http://www.flickr.com/photos/medmss/> accessed 24.03.2012]. As an example of an application that could be applied in this instance, Yunhe Shi has developed a Flickr app that automatically places photographs on maps which could be used to show the spatial distribution of Islamic art objects (Yunhe Shi Flickr app [<http://www.flickr.com/services/apps/72157627414951586/> accessed 24.03.2012]).

⁹¹ Islamic manuscripts curators' roundtable, Centre for the Study of the Book: summary of the roundtable meeting on Islamic manuscripts online catalogues, 27 November 2007, Rothermere American Institute, University of Oxford [http://www.bodley.ox.ac.uk/csb/roundtable_islamicmss.htm accessed 24.03.2012].

Conclusion

The study of the visual cultures of the Islamic world has already been marked by the digital shift now underway. Although massive projects lie ahead, manuscripts that were previously inaccessible have become readily available. Rare books and primary sources are more easily accessible. Photographic records of sites are more numerous than ever before. In many cases scholars of Islamic art have been accidental beneficiaries of the efforts of others. However, the digital shift is not merely a change in the accessibility and speed of information, nor is it a neutral endeavour unencumbered by overarching political contexts and disciplinary priorities. It also brings an additional, perhaps overpowering means of knowing about one's subject. In short, the digital shift is not merely a change in the way information is distributed, but one that brings with it epistemological consequences. It transforms upwards the scale of the problems conceived and explored, and it requires large volumes of quantifiable data. It also encourages computer-enhanced modes of reading, viewing and analysis over unaided approaches. That the digital shift will be fractured, messy, incomplete, expensive, and chaotic is a given. Equally certain, it will transform, for better or worse, enquiry in the humanities as it has done in the sciences. If the digital shift is an epistemological shift then it is one that calls upon researchers to re-examine what their questions are, how they explore and answer them, and how these activities can and cannot be translated into the digital environs.

The digital shift is also about how we, as collectives, remember and forget, and who has authority over what can be remembered and how. Not only do the underlying political orders and cultural values of archival legacies and their orderings permeate the new digital archives and analytical tools, but so too do the assumptions of software designers and the disciplinary perspectives involved. The design of the database and its analytical tools, then, is the terrain of historiographical negotiation, where the future of many possible lines of inquiry will be delineated in broad strokes.

For Islamic art historians the digital shift is an impetus to rethink the discipline, and at the same time to question more deeply how its archives have been and will be constituted and accessed. There are particularities to the study of Islamic visual cultures that need to be collectively articulated more clearly and incorporated into the thinking behind the construction of its digital archives and cultural analytics. Archives and tools developed primarily with European, American or East Asian artistic traditions in mind are not automatically suited to the problems of studying Islamic visual cultures. These particularities stem from things like the media preferred, the prominence of the Arabic script, the multitude of transliteration systems, design vocabularies, dating practices, nomenclature, naming conventions and geographies, and the legacy of imperial-era archival systems.

There has always been an asymmetry to the ways the fields of Western art history and Islamic art history have developed. The former has been historically invested in the idea of constructing a notion of the Western self and statehood, whereas the latter has emerged in the context of colonial relations and has been

plagued by a quest for legitimacy and resources. Given the limited number of digital humanities initiatives and their modest ambitions, it is not unreasonable to assume that the transition to digital archiving and appropriate analysis for Islamic studies, and for the study of the Islamic world's historical visual cultures, is taking place at a far slower rate than is the case for the art histories of other regions such as Europe, the United States, Taiwan, China and Japan. A pessimist could conclude these efforts may never reach the kind of critical mass, degree of systematization or analytical sophistication necessary for the full rewards of the digital transition to be realized. The willingness and capacity of states within the Islamic world to lead the digital shift in Islamic studies and art history is not uniform; nor are the perceived requirements that might shape such initiatives. Despite the wealth of some states of the Islamic world, many others simply do not have the necessary resources.⁹²

A digital divide appears to be emerging between the ways the visual cultures of the Islamic world and those of Europe, North America and East Asia will be studied in the future. In other words, the processes of digital archiving and analytical tool development reflect the geopolitical, economic and technological orders of the day. Greater coordination within the field of Islamic art history over the identification of its priorities; more technological literacy; better communication with archiving bodies, and greater collaboration with governments and institutions in Islamic countries are among some of the strategies that can help ameliorate the growing divide. It is clear that digital humanities is here to stay, along with its ways of knowing about the world, but what is less clear is how the field of Islamic art will adapt to the digital turn.

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⁹² Consider the following statement from Pakistan's Sindh Archives, which reads more like a plea for help than a confident march into the digital world:

The process of digitization of manuscripts in Pakistan is at initial stage. Few organizations have recently started digitization of manuscripts with their records. In this field Pakistan could not make considerable progress due to some problems i.e. Lack of funds & expertise in this field. During last few years some public and private organizations like Sindh Archives, National Library, International Islamic University, Punjab University, Pashto Academy and Higher education commission have started the process of digitization.

The Sindh Archives, Karachi, is a pioneer in digitization of manuscripts. The work was started there during 2005. Senior Professors in Library Science, experts in manuscripts and IT professionals have been developing proven softwares for entire collections. Software titled, 'Manuscript Search Program' (MSP), has been recently completed. Data entry through it is in progress. Brief description/catalogue of manuscripts available at this repository may be available online shortly through website www.sindharchives.gov.pk. Whole work of digitization is being done with the meager resources available in Pakistan. Since it is a new field therefore experts are not locally available. Technical assistance in this regard is very much needed to improve the quality of work and make these softwares useful for all.

Sindh Archives, Islamic Manuscripts in Pakistan [<http://www.sindharchives.gov.pk/articles.aspx> accessed 24.03.2012].

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