Understanding the pre-colonial world through computational history: exploring options for Asia-Africa collaboration

Report on a workshop held at the Johannesburg Institute for Advanced Study in Johannesburg, South Africa, on 13-16 November 2017

ON 14-16 November 2017, JIAS hosted a ground-breaking workshop on 'Understanding the pre-colonial world through computational history', aimed at examining options for southern African participation in computation history programmes, specifically the Interactive Global Histories (1205-1533) project based at Nanyang Technological University (NTU) Singapore. The project is led by Dr Andrea Nanetti, Associate Professor and Associate Chair (Research) of the School of Art, Design and Media at NTU; a senior researcher at the Complexity Institute in Singapore; and the holder of a courtesy appointment in the NTU School of Humanities (History Programme). Dr Nanetti headed the NTU team attending the workshop, also comprising Assistant Professor Joty Shafiq Rayhan (School of Computer Science and Engineering and Engineering) and Dr Mikhail Filippov (School of Physical and Mathematical Sciences).

The Interactive Global Histories project (1205-1533)

This project is described as an experimental case study of intercontinental trade, diplomacy, conflicts and other interactions among cities, nations and continents in the Late Middle Age and Early Renaissance (1205-1533 CE). It is based on an ongoing research project entitled Engineering Historical Memory (EHM), conducted at Nanyang Technological University by Andrea Nanetti, Siew Ann Cheong and Mikhail Filippov. The two main aims of the Interactive Global Histories project are to: 1) test methods for organising texts, images and sounds into a relational database suitable to developing a systemic approach to the study of complex interactions among key subjects in a given historical landscape; and 2) exploring the construction of coherent narratives from growing historical data and metadata that could be tested at the same level of rigor as scientific hypotheses and theories. The project is based on the vision that the generation of such narratives, automatically and in a scalable way, and supported by a new coherent ontology, could revolutionize the practice of historical studies.

The workshop engaged historians and scientists interested in the pre-colonial world, as well as those interested in the developing field of the digital humanities. It was attended by Dr Nanetti and members of his team at NTU on the one hand, and eminent scholars from various universities in southern Africa on the other.

Workshop on computational history

Participants

The participants were:

- Dr Andrea Nanetti, Associate Professor and Associate Chair (Research) of the School of Art, Design and Media at NTU Singapore; senior researcher at the Complexity Institute in Singapore; and the holder of a courtesy appointment in the NTU School of Humanities (History Programme).

- Dr Mikhail Filippov, Research Fellow of the Division of Physics and Applied Physics at NTU Singapore, and an Honorary Research Fellow of University College London.

- Dr Joty Shafiq Rayhan, Assistant Professor in the School of Computer Science and Engineering, NTU

- Maarten de Wit, Professor and Director, Earth Stewardship Science Research Institute (AEON-ESSRI) at Nelson Mandela Metropolitan University

- Simon Hall, Associate Professor and Head of the Department of Archaeology at the University of Cape Town

- Yussif Adam, Professor at the University Eduardo Mondlane, Maputo

- Dr Abigail Moffett, Department of Archaeology, UCT

- Mussa Raja, Professor at the University Eduardo Mondlane, Maputo

- Dr Nicholas Zachariou, Department of Archaeology, UCT.

Welcoming remarks

Prof Peter Vale, director of JIAS, said the workshop was aimed at exploring the potential of collaboration on this project and in the field of computational history in general to strengthen Asian-African scholarship.

One of the goals of deliberation at JIAS was to encourage deep forms of conversation on interdisciplinary issues, referred to as 'slow scholarship'. The forthcoming discussions promised to be a rich exchange between disciplines and methodologies, and of ways in which the world could be understood. Something else was at stake, namely the opportunity to draw computational methods closer to the humanities.

JIAS was unique among Institutes for Advanced Study in that it linked two continents and universities, namely the UJ and NTU. As such, it sought to push intellectual boundaries, and to create linkages between scholarship in the Global South.

Besides outreach work and an annual colloquium, its work encompassed slow scholarship in the form of conferences, workshops and seminars which examined key issues in greater depth. In this instance, it was exploring options for bringing together two worlds, namely the precolonial world and the world of computational sciences.

As such, it was an interesting and significant moment in the history of the university and the institution, namely to try to let the wall come down between the humanities and the sciences.

Dr Nanetti said each generation of historians and others humanities scholars were traditionally required to reread the primary sources, and rewrite or revise their own national or regional histories in terms of their new insights. However, the insight had grown that primary sources should be made machine readable in order to realise the real help that digital technology can give to the humanities. Computers could not do the work of humanities scholars, but could help the humanities by automating what could be automated.

Introductory presentation

Dr Nanetti then gave an introductory presentation on 'Interactive Global Histories: Historical Sciences into the Computation Era'.

He said it was rare to have a group of people gathering for two to three days to discuss potential collaboration. The discussion would also involve the future of higher education, and what current academics intended to teach their students in the near future in the subjects and topics under discussion.

The title of his presentation was a proposal, but also a matter of fact. Many disciplines were being brought into the computational era, and the question was whether this could be done with the historical sciences as well. 'We are investigating how historical scientists can get into the computational era -- what computational history is, how it works, and how it can help historians to address the major questions of history.'

The role of the humanities

The role of the humanities involved three dimensions, namely point of view, vision, and responsibility. 'Clarifying our point of view involved understanding where we come from, which helps us to understand who we are. Understanding where we are now enables us to develop a vision of where we want to go, and what we want to become. Lastly, this involves assuming a degree of responsibility for our futures -- of assessing why we want to choose this particular outcome.'

Heritage, construed as the treasure of human experiences, implied three key research questions: why humans treasure human experience; how they do so; and finally, what has been treasured thus far, and what would be inherited by Artificial Intelligence (AI).

The humanities were currently in a weak position in terms of their development in this century, or proposing visions for the future. 'The way we are proposing is more difficult, experimental, and experiential.'

History and an anthropological approach to communication and knowledge transmission had revealed that whenever shift in media took place, whatever was not reloaded into the new media ran the risk of being underestimated in the future.

There were manuscripts from the print era in libraries all over the world, but they were not easily accessible. Even if digital versions could be accessed online, this was often not affordable, and languages were a barrier. Therefore, the information in those media was not easily encoded into the new media.

Major issues surrounding AI

As a result, the question of what could be inherited by AI was vital and well as complex. There were two major issues. The first was how AI could be trained and educated to recognise the core values of investigation in the humanities.

The second was what information could indeed be shifted into AI. It was widely believed that the storage capacity of computers was infinite, but this was not true. 'We do not have the capacity to store everything, and we don't have the computational power to process those big amounts of data. Therefore, in studying the humanities, we cannot keep everything we have. The humanities study culture, we know that selection is the basis of any culture. If you want to have culture, you have to select things, and combine them into a new vision.'

The key question was how the treasure of human experiences could be reloaded into an AI perspective. This was a big scenario. but the more focused and simple question he wanted to put on the table was how primary sources could be made machine-readable, and to what extent, thus allowing a democratisation of primary sources.

All scholars had a top-down approach to historical sources. 'We start from preferred solutions, amounting to a predetermined set of assumptions, and we study the primary resources in order to determine whether they support those assumptions or solutions. Often, we filter the data precisely to match our preferred solutions. Instead, one aim of our programme is to demonstrate how computational methods could enable a bottom-up approach - to start by gathering primary data, and to develop explanations and theories from those without trying to make them fit any preferred solutions.'

Dr Nanetti showed an animated video produced by students at the NTU Singapore about the Chinese One Belt, One Road (OBOR) or Silk Road initiative. The video was aimed at exploring whether animated multimedia presentations could be used to convey a complex topic to an audience in a very brief time. 'Our plan was to create a knowledge aggregator for the One Belt, One Road Initiative, using interactive animations to integrate and present the information from various sources and countries as new way of understanding the centuries-old Silk Road metaphor.'

As it stood, the animation primarily depicted Eurasian linkages. While Africa had played a major role in the earlier Silk Road narrative, and there were extensive references to this in the existing literature, the continent itself was still effectively absent from this discourse.

The Interactive Global Histories case study

Interactive Global Histories was an experimental case study of interactions among cities, nations and continents during the Late Middle Age and Early Renaissance (1205--1533 CE). It formed part of Engineering Historical Memory (EHM), an ongoing research project at NTU Singapore, devised by Nanetti and conducted by himself, Siew Ann Cheong and Mikhail Filippov.

The case study currently involved ten scholars in different parts of the world, drawn from different disciplines and different perspectives. The idea was not to extend the project indefinitely, but to start collaborating on an individual basis with people who dealt with relevant primary sources in relevant areas. The people who were currently involved in the project were acquainted with certain types of primary sources.

Africa was still absent from the project. Some information was available, but data from Africa itself about its interaction with other countries and continents was lacking. Therefore, they wanted to expand the geography of the collaboration, convey what it was offering, and what they were asking as a team. The workshop was partly funded by the Global Dialogue Institute at NTU Singapore, and part of its function was to offer and ask for dialogue.

Dr Nanetti then spoke about the reasons for selecting the period in question. This included the fact that it offered 'just enough but not too much' historical evidence for feasible tests of new ways of organising texts, images, and sounds in a relational database suitable to developing a systemic approach to the study of complex interactions among key players in history.

This included the study of maritime space. As David Abulafia of Cambridge University had stated at a conference on Maritime Heritage held at NTU Singapore in 20 November 2015, studying maritime spaces enabled scholars to break free from national histories extolling the achievements of particular peoples and dynasties that had long dominated writing about the past a new approach was obviously attractive in an age of globalisation 'Out of this have grown new ways of studying maritime history, which has long been anchored elsewhere.'

Adding to this, Dr Nanetti said the Atlantic was well studied, and the project had access to primary sources which were linked and interconnected. However, it did not have access to primary data on linkages and networks involving Africa – i.e., Afro-Eurasian networks among Africa, Europe and Asia.

The conventional literature suggested that everything had changed with the discovery of America, and that the balance of historical forces then moved into another direction. But whether this was true was still unclear. Was this a top-down or a bottom-up assumption? Was it

genuinely based on primary sources which demonstrated that the Atlantic trading system had taken over in that period, or something that scholars had assumed from a 20th century perspective?

Much or all of the existing literature started from the assumption that everything had changed with the so-called geographic discoveries. The challenge was to establish what had been discovered, and why. The interactive histories project was aimed at going back to the primary sources in order to do so, and placing them on the same platform. This would make them more shareable than before, and also allow the case study to be scaled up more easily.

The major sets of primary sources being studied were the world as seen from Venice, comprising extensive chronicles and dairies compiled in that period; the world as seen from the Mamluk Sultanate of Egypt (1205-1517), recorded in a remarkably integrated set of chronicles, diaries, paintings, engravings, and printed material; the world as seen from the Early Ming Chronicles, researched by Geoffrey Wade, among others; the world as seen from the Russian Chronicles, which had been comprehensively collected; and the world as seen from the Arab Chronicles, including a History of India as told by its own historians; as well as maritime archaeology.

Maps as knowledge aggregators

Dr Nanetti then presented the use of maps as knowledge aggregators in an AI perspective. Maps compiled in the Italian Maritime Republics in the 15th century AD reflected regional and even global geopolitical relations, including relations involving geography, ideology, politics and commerce. Place names in Mediaeval and Renaissance representations of the world were understood as *loci* — i.e., gateways to a rich variety of information, spanning people, cities, regions, and animals; world trade; and terrestrial and maritime trade routes.

This included the so-called Fra Mauro *mappa mundi* (map of the world) produced in the mid-15th century, which had helped scholars to unpack the three principal social and cultural process that characterised the history of Venice in that period: the development of long-distance information networks; the foundation of a global economy in which Venice served as one of the leading protagonists; and an expansion into spaces and areas that were previously not believed to be accessible to man. By means of words and images, Fra Mauro's work synthesised and recapitulated crucial aspects of 15th-century culture, including Aristotelian-Christian cosmology; the Aristotelian-Ptolemaic cosmography of the sublunar world; the geography of peoples and commerce; nautical and Ptomelaic cartography; ethnographies and travel accounts (largely Marco Polo); descriptions of the principal routes for the global trading in spices, gold and silver; and the histories of ancient and more recent conquests. All these frames of references were linked together and developed within the epistemological unity of the *mappa mundi* (as reflected in the work of Piero Falchetta and Angelo Cattaneo).

Similarly, modern internet search engines and map services could be combined to produce interactive maps in which these historical databases were embedded and could be combined in various ways to produce automated narratives.

A major limitation of the older maps was that they had to be completed before they could be used, and also that they could not easily be updated. By contrast, the data depicted in the online maps could be continually updated. Using these maps as modern knowledge aggregators could revolutionise the practice of historical studies.

The scope of computational history

Next, Dr Nanetti examined the issue of what could be automated in the historiographical process -- i.e., what the scope of computational history could be.

Humans had two different ways of sharing space-time, namely physics (which could be measured) and history (evidence gathered via personal observation or experience). The issue was which of these should be taught to machines.

In order to become computational, a discipline had to progress from data collection to data management, data visualisation, and data modelling and simulation, which linked back to the previous stages in turn.

Computer simulations could help the historical sciences to develop a shared model for assessing primary and secondary sources. It could also help historians to identify and assess the problems that needed to be investigated.

Automatic narratives

Dr Nanetti then showed how automated narratives could be extracted. These would comprise the identification of complex networks of historical actors, connected by different types of links representing different kinds of socio-political relations (including trade, diplomacy, and conflicts.) Higher-level information that could be extracted from this network included power blocs, which would emerge as clusters of historical actors.

The elements of these narratives would be key actors (who), key events (what), key periods (when), key locations (where), key factors (why) and key actions (how). Automated narratives would be extracted from these elements. Time-resolved dynamics could be produced, as some links would become inactive, while others remained active.

Dr Nanetti showed slides of a website for the Interactive Global Histories project (www.engineeringhistoricalmemory.com) featuring an interactive map as well as a search function for data in terms of various different parameters.

Workshop on computational history

It encompassed a crucial period in which, in terms of the conventional top-down perspective, a significant shift had taken place, from regional to global networks. This was commonly attributed to the geographical discoveries at that time. Those assumptions were very clear in the literature. Thus far, however, researchers working on this project had not been able to find evidence of this in the primary sources. 'What we have found is that an intercontinental network existed before this period, which case studies of pottery, iron, and other materials could easily illuminate.'

Moreover, the research also pointed to a significant degree of continuity, with the intercontinental networks of the 16th and 17th centuries essentially the same as those in the 14th and 15th. The challenge was how to make the primary sources readable and accessible.

In conclusion, Dr Nanetti said the aim of the project was to share primary historical sources about the period in question, and to make them more shareable Even for this period, the amount of data was huge, but it was possible to deal with it, and the project was achievable. 'Having investigated where we come from, and understanding where we are today, the next question is, what's next in the case for truth.'

Sources

Dr Nanetti referred to three core sources of information about the case study and the broader project:

Andrea Nanetti and Siew Ann Cheong, Computational History: From Big Data to Big Simulations, in Shu-Heng Chen (ed), *Big Data in Computational Social Science and Humanities*, Springer Series on Computational Social Sciences, forthcoming.

Andree Nanetti, Siew Ann Cheong and Mikhail Filippov, 'Interactive Global Histories: For a new information environment to increase the understanding of historical processes', in *Proceedings of the International Conference on Culture and Computing 2013* (Kyoto, Ritsumeikan University, Sept 16-18, 2013. Los Alamitos, CA: IEEE Computer Society, 2013, pp.104--110. DOI: http://dx.doi.org/10.1109/CultureComputing.2013.26

Nanetti, Andrea (guest editor). Revisiting the World of Fra Mauro's Map and the Morosini Codex in an Artificial Intelligence Perspective. In: *The Asian Review of World Histories*, Vol 4/1 (January 2016). Published on 7 May 2016, Special issue (authors: Andrea Nanetti, Cheong Siew Ann, Angelo Cattaneo, Mikhail Filippov, Lin Chin-Yew. ISSN 2287-98111 (online) and 2287-965X (print). Link http://www.threawh.org/5_journal1a_2016_1_1.htm

Andrea Nanetti, Angelo Cattaneo, Siew Ann Cheong and Chin-Yew Lin. Maps as Knowledge Aggregators: from Renaissance Italy Fra Mauro to Web Search Engines. *The Cartographic Journal*, vol 52 no 2, pp 159-167. International Cartographic Conference, Rio 2015. Special Issue, May 2015.

Presentations by members of the NTU team

Dr Mikhail Filippov of NTU Singapore made a presentation on a study co-authored by Associate Professor Siew Ann Cheong and entitled 'Agent-based modelling and simulations for the historical sciences'..

Dr Joty Shafiq Rayhan made a presentation on 'Databases and Data Analytics for the Historical Sciences'.

Discussions

These three presentations provoked intense and sometimes heated discussions in which southern African scholars closely interrogated — and sometimes contested — the ability of computational sciences to contribute to disciplines with, in their view, had intrinsic conceptual and normative content, and therefore resisted being broken down into entirely value-free' facts' on the one hand, and 'propositions' on the other.

Presentations from Africa

- Alive Corridors: towards a transdisciplinary autobiography of Africa – Maarten de Witt

- Expanding Frontiers in Southern Africa – Simon Hall

- Presentation from Mozambique – Yussif Adam

- The Indian Ocean Rim: The Early Iron Age – Abigail Moffett

- Presentation from Mozambique –Mussa Raja

- Global Cultural Flows in the 19th Century – Nicholas Zachariou

The presentations were followed by discussions.

GENERAL DISCUSSION

A general discussion followed. **Peter Vale** said it was aimed at reflecting on the previous presentations and discussions, to get a sense of whether there was an intellectual project as well as a real world project on which participants and others could collaborate.

Questions included whether there was scope for African-Asian collaboration on EHM and the interactive global histories project, and what the big data and humanities interface meant for undergraduate training.

As regards the intellectual project, participants needed to continue thinking about whether and how the barriers between the natural sciences and the humanities could come down. They had been sharply divided on this issue.

There was a belief at some universities that the language of the fourth industrial revolution could lift the humanities and the natural sciences into an ideal space where they would coexist quite

happily. In his view, this needed to be more closely examined. He asked participants from NTU Singapore to comment on the conversation at their university about science and the humanities.

Mikhail Filippov said computational mathematics could provide a set or rules or a framework to enable such a dialogue. In order to use the outcomes of geology, history and philosophy in a joint narrative, one had to have a platform that allowed people to discuss whether they could meet at all. Databases needed to be combined in a wider setting.

Information from the natural sciences -- including climatology and biology -- could be embedded in those frameworks in order to provide a greater understanding of historical processes. Questions could then be answered by drawing on more than just historical primary sources. This approach allowed case studies to be constructed, and outcomes from different disciplines to be incorporated.

Erasing boundaries between different disciplines was a more complicated philosophical issue. The first task was just to provide the technological frameworks, so a start could be made.

Andrea Nanetti provided an overview of disciplinary and teaching approaches at NTU Singapore School of Art, Design and Media, which, he said, was making an effort to shake off disciplinary constraints. Creativity was enhanced by culture and heritage in a blend of academic research, artistic research, and design research.

The relevant question now was how to recapture the treasure of human experiences into an AI perspective. Some scholars feared this approach. However, whatever would not be reloaded into a machine learning perspective would be lost to future generations.

The workshop had shown that there was a lot from the African perspective that could be connected to the Chinese and European perspectives of the Indian Ocean. However, it would very difficult to place this on a common platform. The material was available, but the issue was now to put it into a single dialogue.

The Fra Mauro map contained a lot of material about Africa, but this had not been studied from an African perspective. Efforts to do so in respect of South East Asia, China and Russia were yielding extraordinary results, as all the entries on the map -- drawings, captions, texts, and place names - could be linked to something specific in those regions.

It would be very interesting to see whether the elements on the map of Africa matched data on the south eastern part of Africa being collected by African scholars. This could be a small case study comprising about 200 items. These could be place names, short narratives, or other forms of data. Historians could then interpret the data in any way they wanted. His interest was firstly to put this kind of dialogue on the ground.

Workshop on computational history

The fact that the entries on the Renaissance maps could be matched with data from other regions meant that knowledge aggregation had paid off. Those maps had been used at the start of modern colonisation. They enabled small groups of people to understand where to start, where to go, and what they were likely to find.

New knowledge aggregators were being developed today, and the issue was how to prepare young people to participate in this process, and benefit from it. His faculty at NTU Singapore was using an interdisciplinary approach. Students needed to be provided with convincing examples, but the 15th-century models were extremely powerful.

Yussif Adam said students would require additional computer training to enter the computational era. In Mozambique, students had no idea of the history of science when they entered the universities, and secondary interventions were needed to rectify this.

Students generally liked working across disciplines, but some were concerned about losing the security of a degree or diploma that could provide them with jobs in the process.

He also spoke about the day-to-day problems and practical constraints facing university staff and students in Mozambique. Following the civil war in the 1970s, education systems were in disarray, and courses were dictated to students by state-controlled committees. The effects were still being felt today.

Many students still did not have computers, or regular access to computers. Computer networks at universities were limited or non-existent. There were computers in libraries, but sometimes they did not work. Books were regularly pillaged.

While full-time students in Mozambique studied for free, part-time students studied after hours had to pay their own fees. As a result, many prospective students were inhibited by a lack of funds.

Referring to the Interactive Global Histories project, he noted that it would be difficult to motivate Mozambican students to research such a short period which occurred such a long time ago. State archives were also difficult to access.

Maarten de Wit spoke about approaches to disciplines and teaching at Nelson Mandela University. Among other things, he said teachers at NMU and other South African universities knew they had to teach their students in ways that could get them a job.

While he understood the reasoning behind the time period chosen for the Interactive Global Histories case study, he also thought students might regard this as too remote and too narrow.

Responding, **Andrea Nanetti a**greed that the time period was narrow, but collecting data even for such a short period was already challenging and demanding. This data could then be used to

inform broader narratives. If used to point to networks of communication, trade, diplomacy, and so on, they could be used to demonstrate developing patterns of global connectivity.

This kind of work in a machine learning perspective needed to be built up from the ground up. This was not possible without contact with people with knowledge of primary sources in different countries or regions.

Simon Hall said there was a lot of discussion in South and southern Africa about archives, how they had been constructed, and what the data actually meant. Archives were often constructed from a particular point of view. As a result, some scholars were questioning their integrity and significance. Responding, **Andrea Nanetti** said similar issues were being debated in other regions as well.

CONCLUDING DISCUSSION

In a concluding discussion, participants considered options for taking aspects of the workshop forward, and for future collaboration on computational history between NTU Singapore and JIAS.

Andrea Nanetti said the options for written output included a workshop report as well as a more rigorous scientific publication.

NTU Singapore was in a position to attract talented graduate students. Besides this, postgraduate study at NTU Singapore was not restricted to students in Singapore, and African postgraduate students could respond to calls for supervised MA and PhD research degrees. If they were supervised at NTU Singapore, they would need to move to Singapore for the duration of their studies.

Another option was student exchange, which was decided at university level on the basis of memoranda of understanding. NTU Singapore would decide which students were eligible.

He also raised the possibility of creating a JIAS scholarship for a South African of African student working in a relevant area, and a reciprocal scholarship for a Singaporean student.

The fourth issue was that of creating shareable resources.

Maarten de Wit proposed a communal project comprising the design of an African Corridor, involving traffic to and from Africa across the Indian Ocean and around the Indian Ocean Rim, to which all participants could contribute. Among other things, there was a huge database about trade routes and patterns in northern Mozambique. This suggestion provoked intensive discussion, but no agreement was reached.

Yussif Adam agreed that significant data on east African precolonial history was available , but much of it was not shared, and a lot of material was in the hands of French researchers. One of

the big problems in Mozambique was a 'hoarding mentality', or a failure to share information, because of the 'eternal struggle' between South Africa and other countries in the region.

Mikhail Filippov said the workshop was aimed at finding a common point of entry into computational history. The NTU Singapore delegation had come with a proposal in the form of a case study. 'We have a case study, and we thought we could present on how you could use our data and our technology in order to enhance your stories, or to build new ones.'

There was a need to encourage young African students. What the NTU Singapore team could do was not just to provide a chapter in the material that could be useful to African scholars, but rather to provide a small case study of how their algorithm could be used in particular ways to work with particular data. If people wanted to share the data, this could be done afterwards.

The point of entry into this new world for history students could include climatology, hydrodynamics, and so on. There were some 15 phenomena relevant to these historical processes in the Indian Ocean.

Yussif Adam said the participants from Maputo would do everything they could to share data. 'In Maputo, we have a culture of putting things in archives, and then losing the key.'

Peter Vale noted that research in Africa was often hamstrung by a lack of manpower. Students from relevant institutions could be roped in to do research, under some kind of collective supervision.

Maarten de Wit said one the proposed corridor had been defined, students could write up different aspects of it under supervision. People could come from the NTU to give them a short course on how to undertake the computing, and utilise the technology that was being discussed.

Andrea Nanetti said three separate things were being proposed. One was the African corridor. The second was that a participant or participants could draft an academic position paper grounded on the evidence and linked to the literature, and submitted to the other participants. The third was to work on bottom-up data from the primary sources, which would be computer-coded.

The African presentations had provided him with evidence of connections between land and sea as well as recorded Swahili memories of the precolonial period , an orientation he did not previously have.

Peter Vale undertook to convene another meeting in the course of 2018 to consider the various options and suggestions. The map project was an interesting possibility. In the interim, JIAS would do some coordinating groundwork. It would also consider undertaking a project on breaking down disciplinary barriers in the Global South.

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