PARTHENOS

Pooling Activities, Resources and Tools for Heritage E-research Networking, Optimization and Synergies

PARTHENOS Foresight Executive Summary

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PARTHENOS FORESIGHT EXECUTIVE SUMMARY

Introduction

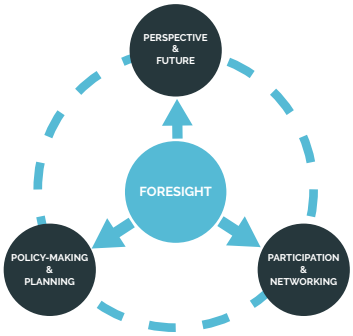
In recent years there has been rapid growth both in the development of digital methods and tools and in their application across a wide range of disciplines within humanities and cultural heritage studies. The future development of this landscape depends on a complex and dynamic ecosystem of interactions between a range of factors: changing scholarly priorities, questions and methods; technological advances and new tool development; and the broader social, cultural and economic contexts within which both scholars and infrastructures are situated.

This foresight study investigates how digital research methods, technologies and infrastructures in digital humanities and cultural heritage may develop over the next 5-10 years, and provides some recommendations for future interventions to optimize this development.

Foresight

Foresight research is a key mechanism for the development and implementation of research and innovation policy in the medium to long term, enabling policy-making bodies to set research priorities and influence the progress of research.

Foresight research is not simply 'future gazing', nor is it just about forecasting by experts, rather it is a way of facilitating structured thinking and debate about long-term issues and developments, and of broadening participation in this process, by involving different stakeholders, to create a shared understanding about possible futures and to enable them to be shaped or influenced.



Engaging a representative range of relevant and informed stakeholders in the dialogue brings several benefits: it extends the breadth and depth of the knowledge base created by the foresight process by drawing on distributed knowledge; it increases the 'democratic basis and legitimacy' of the study report by avoiding a top-down, expert-driven analysis; and it helps to spread the message about foresight activities and to embed it within participating organisations, thus improving sustainability. Foresight studies draw upon existing knowledge networks and stimulate new ones – in addition to any reports produced, these embedded networks are an important output of foresight activities, facilitating a longer-term thinking process that extends beyond the period of the study itself.

PARTHENOS Foresight Methodology

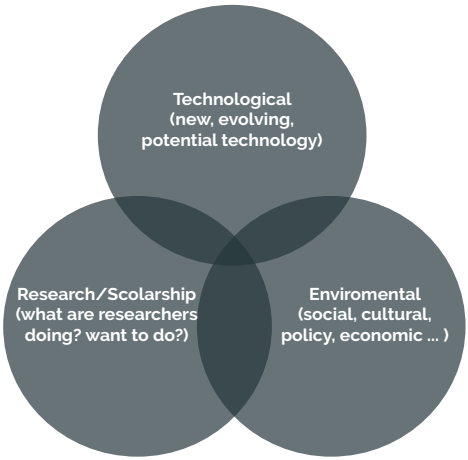
A foresight study may utilize a range of different information gathering methods in the construction of its knowledge base. Specifically, the PARTHENOS foresight study commenced with an initial literature review and landscape scanning, to set the context for the study. This was followed by a series of structured, interactive events that combined expert panels with interactive workshops to obtain input for the study's foresight knowledge base, by curating multi-polar discussions among both experts from relevant backgrounds and a broader range of actual or potential stakeholders in research infrastructures, including (but not restricted to) users/researchers. These events then fed in turn into a series of interviews with targeted stakeholders. Lastly, the PARTHENOS Hub – which is a publication and interaction platform created by the project itself – provided a space to both present the methodology and ask for additional input through a questionnaire. The respective issue can be consulted here: http://www.parthenos-project.eu/portal/the-hub/issue-2.

Within this overall framework, the study followed a thematic approach, structuring its investigations around a two-dimensional matrix of questions that addressed, firstly, the different aspects of the foresight process:

- current trends – what is happening, and what impact is it having?
- potentialities and opportunities – what may happen?
- requirements – what do we want to happen?
- obstacles, constraints, risks and threats – what might prevent this from happening?
- what activities and interventions (e.g. funding programmes, strategic research, service provision) might serve to 'optimize' outcomes?

and, secondly, the different contexts to which those aspects relate:

- technology (e.g. new tools or methods);
- scholarly or professional practice (e.g. emerging research areas, changes in career structures);
- the broader 'environment' (e.g. social, cultural, economic, political, policy).



Findings

This study has found a dynamic field with a host of opportunities offered by new technologies, but requiring additional skills and infrastructure if full use is to be made of the opportunities. The main findings of the foresight study are summarized below, grouped according to identified trends, obstacles, potentialities and requirements.

Trends

The adoption of digital research methods is increasingly widespread in the humanities and cultural heritage sector, with the development of new data sources, technologies, and expanding collaborations creating a dynamic and innovative environment.

The development of the digital humanities has been characterized by the explosion in data available for analysis: **digitized collections; open data; born-digital content**. There are limitations and issues in relation to these, however: there is still a need for further digitization, in particular of collections relating to marginalized groups; significant concerns have emerged about potential infringement of IPR and the GDPR; and big technology companies are raising barriers to access to their data.

There is also a wide range of tools for analysing these data: **open source software; natural language processing, machine learning, and artificial intelligence tools and libraries**. Open source software enables the broad adoption of new tools and facilitates sustainability beyond a single project, while the development of software libraries for computational analysis offers the potential for widespread automated analysis. There is an important difference, however, between placing software on GitHub and ensuring it is sustainable in the long term, and there is a risk that artificial intelligence may be seen as a vague panacea for all difficulties, without the community fully understanding the potentials, limitations and biases of the tools.

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There has also been an increase in the number and variety of collaborations: **interdisciplinary collaboration; intersectoral collaboration; and international collaboration**. Collaborations between the humanities and other fields, universities and other sectors of society, and across national borders, are increasingly common and bring new perspectives and ideas to projects and data sets. This may be hindered, however, by humanists who are reluctant to embrace digital methodologies, a suspicion of the commercial sector, and certain restrictions on international funding.

These trends towards increased data, tools and collaboration are all

expected to continue into the near future, albeit with the potential for some restrictions on access to data due to concerns about IPR and the GDPR, and more limitations imposed by the big technology companies. The rate of increased adoption of data, tools and collaboration is liable to be constrained by funding limitations.

Obstacles

The opportunities offered by recent technological advances in the humanities have not yet reached their full potential, a situation that has been heavily influenced by environmental obstacles. The three most often raised obstacles were: funding, the digital divide, and concerns about IPR and the GDPR.

The lack of sufficient funding for the digital humanities and cultural heritage sectors, especially since the financial crisis of 2008 and the growing emphasis on the funding of STEM subjects, has had significant consequences for the capability of the sector to meet the challenges of the twenty-first century:

- **Distortion of research interests**: Insufficient funds drives researchers to focus on those areas where funding is available, with an accompanying lack of freedom to explore other areas that they consider important.
- **Loss of people from the sector**: Restricted budgets inevitably lead to a lack of job security, and the loss of team members has ramifications for the sustainability of projects and the loss of vital skills from the sector.

The lack of funding also feeds into the digital divide within the digital humanities and cultural sectors. This digital divide can take many forms, including:

- **International digital divide**: There continues to be significant differences between the research infrastructures available to researchers and research institutes in different countries.
- **Interdisciplinary digital divide**: There are significant differences between the research infrastructures that are available to the digital humanities compared with STEM disciplines that have been prioritized for funding. This, in turn, has contributed to the digital divide in technical skills.
- **Intradisciplinary digital divide**: There continues to be a significant and ongoing divide within the humanities between those who embrace the potential of digital methodologies and those who do not.

There are also concerns about **IPR** and the **GDPR**. The GDPR, in particular, is seen as blocking avenues of research, and preventing humanists researching some of the most important emerging issues affecting the EU, including fake news, populism, and nationalism.

Potentialities

The potential of digital research methods in the humanities and cultural heritage sectors is reliant not on the emergence of new technologies or discoveries, but rather on the application of existing technologies.

The new digital technologies and primary sources offer a host of new possibilities, but a decade of underfunding has left much of the potential unrealized. Particular interest was noted in those technologies that potentially offer a technological solution to overcoming the problem of a lack of growth in the humanities:

- **Crowdsourcing**: Crowdsourcing offers the opportunity both to outsource certain tasks to the wider community, thus scaling up certain types of activity, and to engage the public more deeply with humanities research.
- **Artificial Intelligence**: Artificial Intelligence offers the potential to contribute to a wide range of research in the digital humanities, but it is important that humanities researchers are willing to investigate the black box of these technologies more fully.

Neither is a panacea to the underfunding of the humanities, however. While they may offer the opportunity to increase the scale of projects, they nonetheless require expert guidance and a fuller understanding on the part of those researchers employing them.

New technologies and publication models also offer the potential for greater public impact:

- **Augmented Reality, Virtual Reality, and Mobile Applications**: The near-ubiquitous mobile smartphone, and the growing potential of augmented reality and virtual reality technologies, offer numerous opportunities for promoting research and collections in new ways. Not all will be successful, however, and there needs to be room for experimentation and failure, which is increasingly difficult given the importance accorded to impact and metrics in research evaluation.
- **Open Research**: Open research is seen as having potential not only for improving research access and quality, but also for reaching out to the wider public. For this to be achieved, however, there is a need for funding to ensure that open access policies can be followed.

From a technological perspective, the typical view was the expectation of more of the same. However, the impact of these technologies on the structure of the humanities, or the potential of the humanities for culture more broadly, is much less clear.

Requirements

There is a fundamental need for growth in the funding of the humanities and cultural heritage sector to ensure that it can meet the challenges of the twenty-first century and our increasingly technology-mediated society.

This is not simply a request for unlimited funds to support blue-sky thinking, but reflects the need for a discussion about the "fundamental questions" and "inspirational goals" that the community has to offer society. It is not just a matter of technologies, but rather about finding the questions.

At a European level there is a need for a stronger European lead, with a more explicit European Commission strategy on cultural heritage, and more visible public institutions offering leadership on research infrastructure and standards. It was suggested that cultural heritage institutes may contribute to the building of a European identity in the same way that 18th and 19th century cultural heritage institutes contributed to nation building. Europe is not a single homogenous region, however, and there is a need for segmentation in future digital humanities strategy, with different regions requiring different answers. This means that there is also an important role for national governments in ensuring sustainable levels of support for the humanities and cultural heritage sector.

There is a need for a suitable information regulation framework that supports rather than hinders humanities research; this framework should distinguish between the work of academic or public sector researchers and those from private corporations, and should recognize that the protection required when handling personal health records differs from the protection required when analysing political commentary that is already in the public arena.

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Finally, as more than one contributor noted, there is a need for more projects similar to the PARTHENOS Foresight Study (or indeed a sustainment or continuation of this study), that engage with professionals in culture and heritage to ask them what they see happening and what their needs and issues are. The digital humanities and cultural heritage sectors form a diverse community, without a single voice, and it needs to find that voice if it is to meet some of the challenges of the twenty-first century.

Research Agenda

From the foresight study, five broad themes emerge that should form the basis of a research agenda in the digital humanities: public engagement; research infrastructures; development of the digital commons; artificial intelligence; and impact and evaluation methods and metrics.

Public Engagement

Public engagement is an essential part of ending the underfunding of the humanities and cultural heritage sectors. The contribution of STEM research to society is widely recognised in a way that the contribution of the humanities is not, and there is a need for humanists to make the case for their work more forcibly with a combined voice.

There are many ways that the new technologies can be used by humanists and cultural heritage sector to ensure research outputs are as widely accessible as possible: open access, open data (following good data practice), social media, augmented reality, virtual reality, and mobile apps. Crowdsourcing platforms can also be used for soliciting contributions from the public. Engagement, however, is not just about promotion of research or extracting free labour, but about engaging with the public to ensure the humanities are meeting the challenges society faces at the beginning of the twenty-first century, whether that is fake news, nationalism, populism, or climate change, and demonstrating the contribution humanities research is making to these grand challenges.

Research infrastructures

The value of recent initiatives in the development of research infrastructures were widely recognized in the foresight study, as they provide a certain amount of sustainability to research projects, and more development of research infrastructures for the humanities and cultural heritage sector was seen as necessary.

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At a time when projects are often short and the competition for funding is fierce, research infrastructures need to facilitate collaboration and sustainability, establishing communities around the infrastructures that are developed. It is important that research infrastructures do not simply perpetuate or exacerbate existing inequalities but help to bridge the digital divide. New research infrastructures, or enhancements to existing ones, should:

- bring to the fore marginalised collections.
- ensure access and analysis is not only possible by the technologically literate.

- provide data services and tools as well as data.

Importantly, research infrastructures should feed into the public engagement by being visible, and findable, and should be used to establish authority in the development of standards and best practice.

Development of the digital commons

New data sets and new technologies offer the potential for a host of new research questions to be addressed, but the humanities must be more critical in both the application of digital methodologies and the data that is available. The digital humanities should not be reduced to the application of trendy technologies and data sources looking for research questions, but rather answering the big questions, while at the same time enhancing the digital commons and other digital resources. There is significant work to be done in:

- making new collections freely available online, especially those from marginalised communities.
- integrating diverse data sets.
- building context and provenance for online resources.

These issues are particularly important in the context of the widely recognised potential for artificial intelligence.

Artificial intelligence

The potential for artificial intelligence, machine learning, and other large-scale computational methodologies are as prevalent in the humanities and cultural heritage sector as the sciences. It is essential, however, that these technologies are not simply applied in an ad hoc manner, but are applied critically with attention to sustainability and ethical considerations. There is in particular a need to focus on:

- the ethical implications of the application of AI technologies.
- real world applications that are reusable.
- ensuring the technologies are used to help close rather than extend the digital divide.

Impact and evaluation

Impact and evaluation are important parts of the research process, especially when ensuring that limited funds are used in the best way possible, and it is essential that new methodologies and metrics are developed for measuring impact and evaluation that reflect the specific needs of the humanities and cultural heritage sector. These methodologies and metrics should incentivize innovation, sustainability, and public engagement. They should also recognize a far wider range of outputs and applications, and contribute to the development of standards and best practices in research evaluation.

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