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Sfide etiche di un hub italiano di resilienza culturale: Piattaforma MNEMONIC

Ethical challenges of an Italian hub of cultural resilience: MNEMONIC platform

FARZANEH ALIAKBARI

Farzaneh Aliakbari, PhD candidate in Urban and Regional Development, Politecnico di Torino

farzaneh.aliakbari@polito.it

Abstract

Questo studio si concentra sull'etica informatica e sul suo rapporto con il patrimonio culturale naturale (CNH). La ricerca considera criticamente il concetto di digitalizzazione nel contesto del patrimonio culturale per esplorare i dilemmi etici che vengono introdotti quando i valori del patrimonio culturale sono combinati con le tecnologie digitali. A tal fine, utilizzando un quadro di riferimento consolidato, lo studio esamina gli aspetti sociali ed etici di una piattaforma digitale per il patrimonio culturale: "MNEMONIC: Hub italiano della resilienza culturale". L'Atlante digitale di MNEMONIC mette in rete e rende disponibile un quadro del patrimonio tangibile e intangibile in relazione agli spazi urbani aperti, alle istituzioni della memoria e alle loro attività culturali durante la pandemia di Covid-19. I risultati della ricerca hanno messo in evidenza i problemi di accessibilità, copyright, privacy e sicurezza informatica come i più gravi dilemmi etici della piattaforma. Di conseguenza, lo studio propone diverse soluzioni alternative per attenuarli. La ricerca ha migliorato l'attuale comprensione dei principali problemi etici della piattaforma digitale culturale MNEMONIC, consentendo lo sviluppo di un ambiente digitale equo.

This study focuses on computer ethics and its relationship with the natural cultural heritage (CNH) domain. The research critically considers the concept of digitalization in the context of heritage to explore the ethical dilemmas that are introduced when cultural heritage values are combined with digital technologies. To this end, by utilizing an established framework, the study examines the social and ethical aspects of a digital cultural heritage platform, "MNEMONIC: Italian hub of cultural resilience". The digital Atlas of MNEMONIC networks makes available a picture of the tangible and intangible heritage of urban open spaces, memory institutions, and their cultural activities during the Covid-19 pandemic. The research findings emphasized the issues of accessibility, copyright, privacy, and cybersecurity as the most serious ethical dilemmas of the MNEMONIC platform. Hence, the study proposes several alternative solutions to alleviate those dilemmas. The research improved the current understanding of the main ethical issues of the MNEMONIC digital cultural heritage platform, allowing the development of a fair digital environment.

1. Introduction

During the last decade, we have witnessed incredible advancement in the growth of research on the digitization of cultural heritage. However, addressing the issues of computer ethics in digitizing our heritage has always remained

behind. Norbert Wiener was the first academic who discussed the social and ethical implications of computers and proposed moving "from know how to know what"[1]. ''Who owns the past?" and "What our cultural legacy will be?" are two questions that reflect on the ethics of cultural heritage[2]. The UNESCO definition of ethics refers to behavioral norms in a community or society, not necessarily from a legal standpoint, but from a human or cultural perspective[3]. Society is the end-user of Information Communication Technology (ICT), and the computer ethics domains concentrate on the social and ethical implications of this use.

A conceptual framework designed by Patrignani[4] describes computer ethics based on an applied ethics approach. This framework is described by two dimensions: the vertical and horizontal dimensions (Figure 1). The vertical layers represent the areas impacted by computers like Planet, Biosphere, People, Infosphere, Cyberspace, and Ideas. The horizontal domains demonstrate the critical issues related to computers such as the Dawn of cyberspace, and e-Democracy, Accessibility, Universal Access & Digital Divide, Workplace, Content & Education, Copyrights, Hackers, Privacy, Computer Crimes & Virus, Computer (Un)Reliability, Artificial Intelligence, War, Ecology & Recycling[5].

It has outstanding the Patrignani framework properties for a systematic analysis of the ethical issues associated with a digital platform and describing several areas of impact of computers on society. This framework, although dated, provides a comprehensive and well-established approach to ethical analysis associated with a digital platform that can be replicated and used within the current digital environments. However, less effort has been made to use this model as a qualitative map for analysis in the digital heritage field. The digitization of cultural heritage is considered a critical challenge in order to make it accessible to all[6].

The present paper presents a digital cultural heritage platform ("MNEMONIC: Italian hub of cultural resilience") and takes the advantage of Patrignani framework to analyze the most critical computer social and ethical issues involved in the platform. The MNEMONIC platform digitally visualizes the tangible and intangible heritage values by narrating the memories of society and experiences of CNH assets during the lockdown period. The study uses the MNEMONIC platform as a case example and seeks to investigate to whom this digital heritage belongs and what are the ethical dilemmas in the digitalization of CNH?

On the basis of this framework, it then describes the stakeholders, ethical dilemma(s), and provides some alternative scenarios. This method formed a novel investigation for the MNEMONIC platform as a case study to identify and analyze the potential ethical issues associated with digital technologies and cultural heritage domain.

2. Methodology

The current investigation involved collecting and analyzing ethical dilemmas introduced by Patrignani, 2008, to determine the levels of ethical dilemmas in a digital cultural platform. The research analysis was conducted through four

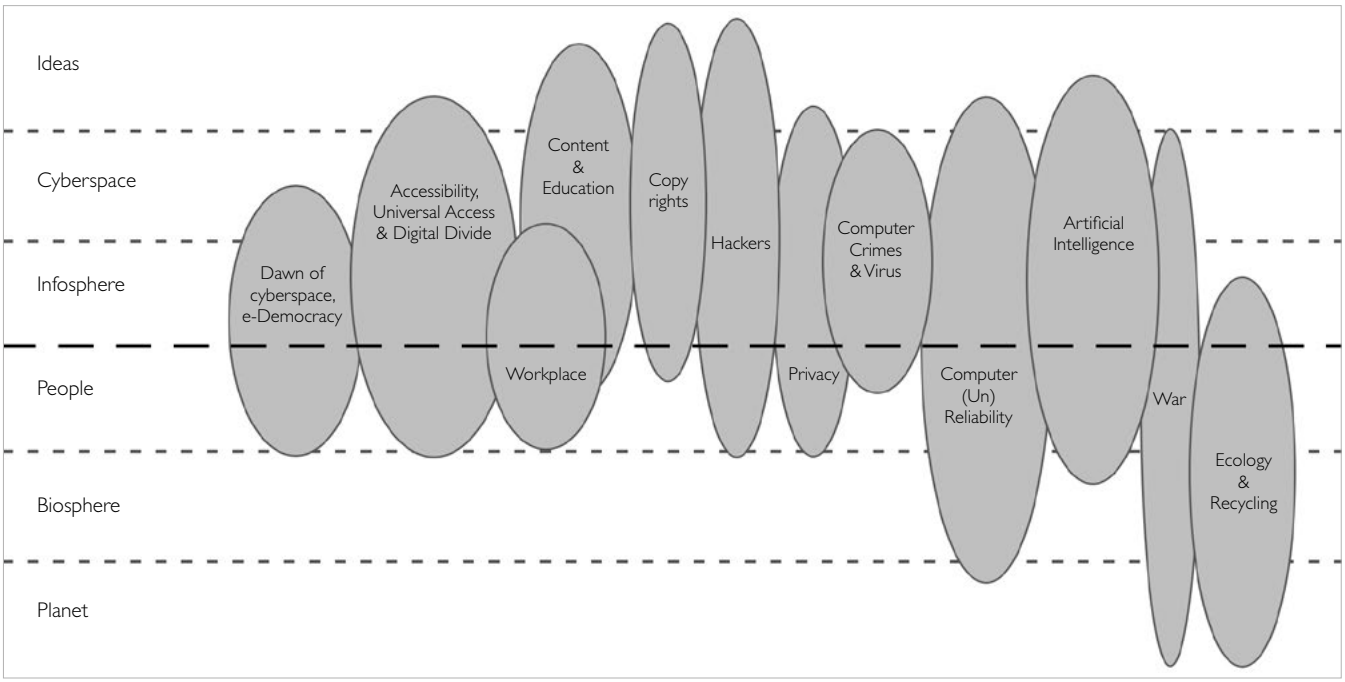

Figure 1. A conceptual framework for computer ethics. Source: N. Patrignani, A Conceptual Framework for Computer Ethics, *in T.W. Bynum, M.C. Calzarossa, I. De Lotto, S. Rogerson (eds.),* Living, Working and Learning Beyond Technology, *Proceedings of ETHICOMP 2008 – The Tenth ETHICOMP International Conference on Social and Ethical Impact of Information and Communication Technology (Mantova, 24-25-26 settembre 2008), Tipografia Commerciale, Mantova 2008, p. 641.*

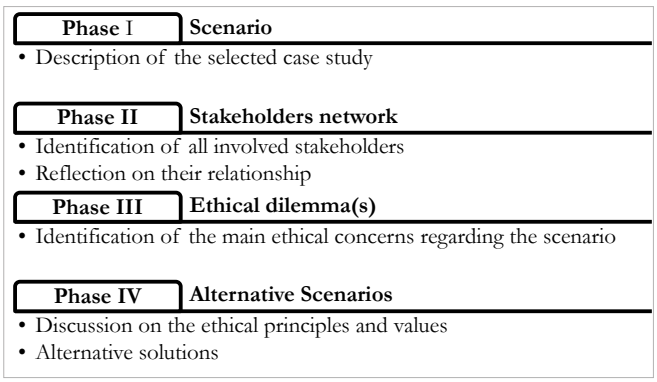

Figure 2. Overview of the research methodology. Source: elaboration by the author.

main phases; defining the scenario, mapping the stakeholders' network, identifying ethical dilemma(s), and recommending alternative scenarios. Figure 2 shows an overview of the research methodology following the method established by Patrignani as a systematic and structured approach to ethical analysis. By employing this method, different perspectives and interests of stakeholders were taken into account. Furthermore, the ethical dilemmas were identified and prioritized which informed the generation of alternative scenarios and recommendations.

3. Results

The computer ethics domain focuses on the relationship between technology and society. Thus, several ethical issues could have a direct effect on society who are the end-users of this technology. This study focuses on the analysis of possible ethical issues in the digitization of cultural heritage following the model provided by Patrignani. In this section, the above model is applied to a real case study in order to clarify its possible ethical issues. This required looking in turn at the definition of scenario (3.1), Stakeholder's network (3.2), Ethical dilemmas (3.3), and Alternative scenarios (3.4).

3.1 Scenario

The digitalization of CNH assets in Italy has increased due to the COVID-19 pandemic[7]. The country's national lockdown has triggered new types of cultural behaviors and uses of spaces completely different from the pre-quarantine era[8]. This was a turning point for developing the project of "MNEMONIC: Italian hub of cultural resilience" to underline how Italian urban cultural and natural heritage was perceived and communicated during the lockdown[9]. The MNEMONIC research project seeks to investigate the adaptability of tangible and intangible forms of CNH in connection to urban spaces and memory institutions in Italian towns. It examines the temporal framework of Italy's lockdown using a systematic method to study how identities and perceptions of belonging were generated and transmitted as forms of "social resilience" in a digital and urban culture[10]. The Italian hub of MNEMONIC is a digital platform that collects the web experiences produced by the CNH sector starting from the lockdown period. Moreover, it moves through the spaces to discover the peoples' experiences regarding the use of micro and macro spaces. The digital Atlas of MNEMONIC is part of the platform that maps the digital cultural initiatives launched by the private and public sectors of CNH in Italian cities during the COVID-19 pandemic. The Atlas networks and makes available a depiction of tangible and intangible heritage, in relation to urban open spaces and museums and their cultural offerings (http://www.mnemonic.polito.it/). However, although the MNEMONIC Atlas is able to connect and show the cultural initiatives launched by various entities through a digital format, research on possible ethical issues regarding the use of this tool is not yet available. This study is the first attempt that investigates the ethical issues of the MNEMONIC atlas according to the Patrignani framework.

3.2 Stakeholders Network

In this phase, the main stakeholders of the MNEMONIC Atlas with their (inter)relationships are identified and divided into three main groups (Table 1). The first group consists of policymakers from the Polytechnic University of Turin (PoliTo) and Italy's Ministry of Cultural Affairs. The second group is the technology suppliers and designers including computer professionals, data center managers, and content providers. Computer professionals design and build software and websites. The database administrator who oversees and manages data networks is data center management. Moreover, the repository of the data is in charge of the data center. All public and private entities that created cultural events during the pandemic are considered content providers. Consequently, these contents are visualized on the MNEMONIC Atlas. Associations, cultural centers, universities and research centers, foundations, networks, the Italian Ministry of Foreign Affairs, heritage sites, municipalities, and cultural institutions are among the content providers. The cultural institutions include museums, libraries, archives, and religious cultural organizations. The last group of stakeholders is the end-users of the Atlas who are classified into the general public, specific public, and tourists. In this project, special consideration was given to vulnerable people. Therefore, people differently abled were deemed as a specific type of users who could be part of the general public, specific public, and tourists.

Figure 3 shows the relationship among the identified groups of stakeholders. By mapping out the stakeholders' network, different perspectives and interests of the stakeholders involved in the MNEMONIC platform regarding its potential ethical dilemmas and alternative solutions were identified through some individual interviews. The stakeholders were involved in the discussion of ethical dilemmas and alternative scenarios after the platform went online. Into this, stronger

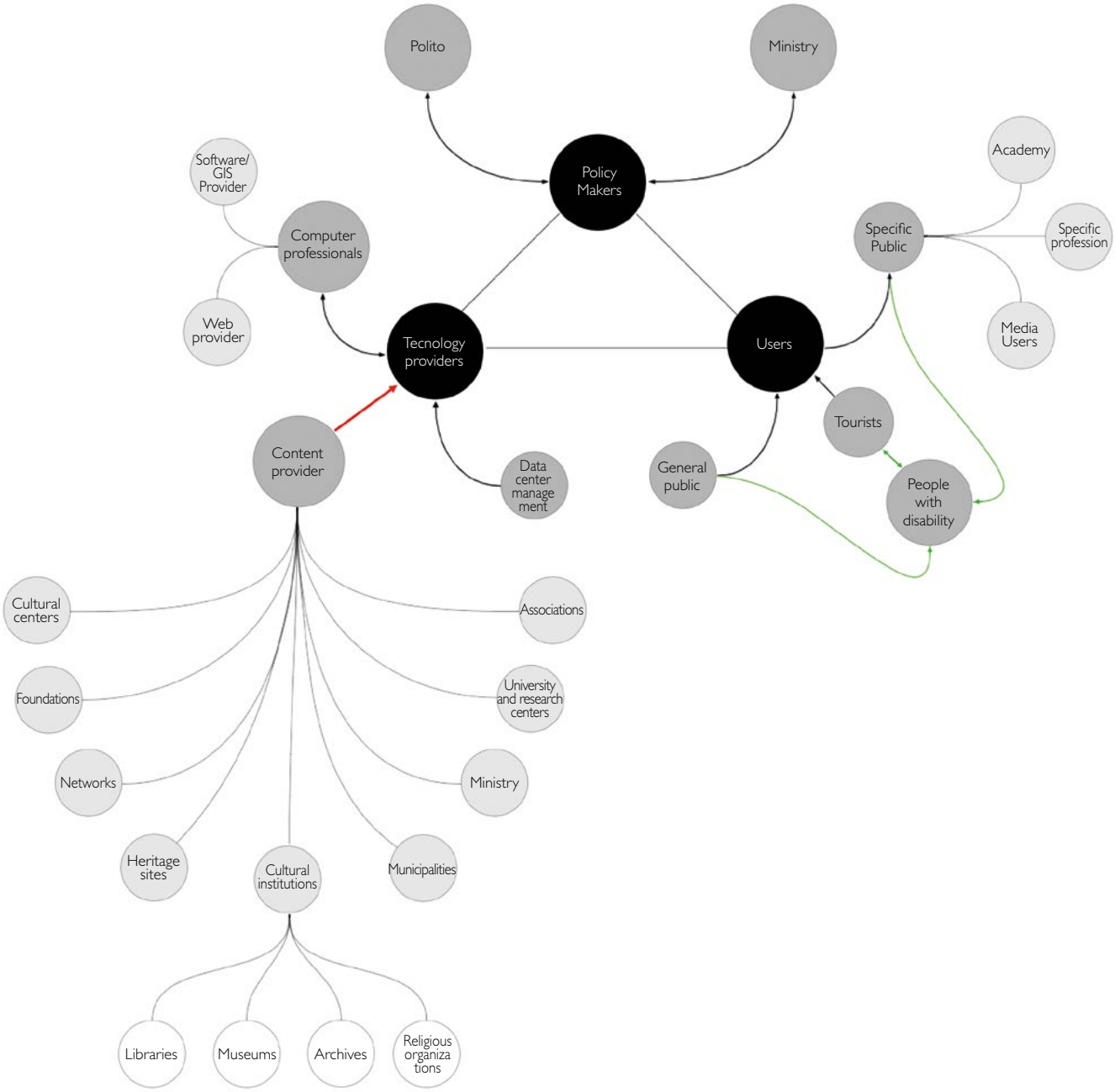

Figure 3. Stakeholders' relationship. Source: elaboration by the author.

relations among stakeholders were designed by high-weight lines. Followingly, the relationships among users, technology providers, and policy makers were considered stronger. Some groups of stakeholders such as content providers and technology providers played a vital role in the development of MNEMONIC Atlas. Thus, the relationship among them was very important (shown in red color), because without receiving data from the content providers who were the cultural entities, the technology providers were not able to visualize the information on the Atlas. Moreover, the differently abled people have also been considered as a special category to test the feasibility of the Atlas regarding their availability to all contents (shown in green color).

3.3 Ethical dilemmas

At the time of crisis, the enormous value of digital tools and platforms in enabling, promoting, and developing the humanities has been demonstrated. Thus, a vast number of digital formats such as applications, virtual tours, and serious games have been produced by the cultural heritage domain. The Italian hub of MNEMONIC has collected and mapped most of those offered projects produced by private and public entities. In this phase, by reflecting on the stakeholders' network the main areas of ethical concern involved in the MNEMONIC Atlas are discussed.

Accessibility, Universal Access & Digital Divide: an overall reflection on the project end-users and technology providers

Key stakeholder groups	Sub-groups
Policy makers	PoliTo
	Ministry
Technology providers and designers	Computer professionals • Web Provider • Software/ GIS provider
	Data center management (Data base administrator)
	Content provider • Associations • Cultural centers • University and research centers • Foundations • Networks • Ministry of Foreign Affairs of Italy • Heritage sites • Municipalities • Cultural institutions ▪ Libraries ▪ Museums ▪ Archives ▪ Religious cultural organizations
End- Users	Specific Public • Specific Professions • Media Users • Academy
	General public (children, residents, families, etc.)
	Tourists
	Differently abled people (blind/deaf/other)

Table 1. Key stakeholders of MNEMONIC Atlas. Source: elaboration by the author.

raises the issue of accessibility. All of the digital tools and formats provided by MNEMONIC Atlas have been deployed to allow people to access from home. However, how equal this access to digitized material has not been responded to yet. As stated by[11], accessibility to digital tools and platforms could be one of the main challenges and pitfalls of the digital. The "digital divide" is a term that refers to the gaps in access to ICT, whether individuals, groups, or entire countries[12]. Without open data policies, developing countries can't close the digital divide[13]. Moreover, the platform may not be accessible to users with different types of ability, which could limit them to use the platform and access its content. The questions are: Do all the people have a computer or a reliable internet connection to access the MNEMONIC atlas[14]? How differently abled users such as blind persons visit the Atlas? Is this platform considered sensorial barriers as well as physical barriers? Does this platform provide a multimedia approach? How many languages will this project support?

Copyright: considering the relationship between the content provider and technology provider the issue of copyright has been raised. Are all the materials furnished by the cultural entities copyright free[15]? If they are not so how MNEMONIC Atlas will pay the content producers?

Privacy: reflecting on the relationship among the content providers and technology providers, the issue of privacy has been underlined. The videos, photos, and other materials that have been produced by cultural assets, were not possible to be visualized on the Atlas since the privacy issues. So, how the MNEMONIC will solve this issue?

Dawn of cyberspace, e-Democracy: the relationship among technology providers and policy makers have concerned this ethical issue. All computer crimes are related to cyber security and taking care of cybersecurity has significant costs[16]. The platform might be vulnerable to cyber-attacks or hacking attempts, which could compromise user data or cause other damage. Therefore, who is going to pay for

MNEMONIC server security[17]? What is the business model of the MNEMONIC project[18]? And how are we going to maintain it?

3.4 Alternative Scenario(s)

After identifying potential questions concerning the ethical behavior of the platform, the research takes more effort in unpacking them and providing possible solutions and obstacles for implementing those solutions. For the *accessibility* issues, the platform relies on operating systems, and web browsers to comply with soft law and its requirement for Italy[19]. Web accessibility issue regards not just web access but in general[20]. There are several alternative solutions to make the Atlas accessible to vulnerable visitors such as blind people. One solution could be providing a text-based version of the Atlas that is compatible with screen readers. This would allow blind visitors to access the same information as other visitors, though in a different format. The text-based version could include descriptions of the contents, along with any additional information that is not easily conveyed through the Atlas. Another solution could be providing audio descriptions of the Atlas that are compatible with screen readers or other assistive technologies. This would allow blind visitors to hear a description of the contents in real-time as they navigate through them, providing a more immersive experience. Considering the *copyright* issue, some possible solutions could be the registration of users, collecting the information of the visitors and the number of visitors who are visiting the Atlas and providing this information to the content providers. In other words, instead of paying to the cultural providers for receiving the content, the registered users' data are given to them. This issue is complex and requires more tasks in order not to raise the privacy issue about the visitors' personal information. Because the platform collects and stores personal information from its users, it creates some concerns about how this information is used and protected. Regarding the *Privacy* issue, the platform could implement stronger data protection policies, limit the collection and use of user data, and provide greater transparency about how user data is used and protected. Moreover, the policy maker (PoliTo) prepares a letter of authorization for the publication of photos and videos to be sent to all content providers and requests their consent to visualize the projects provided by them (photos and videos) on the Atlas. Regarding *cybersecurity* issues, it is needed to implement cybersecurity on relevant servers. However, the complexity of cybersecurity requires the intervention of policymakers[21]. Therefore, policymakers are the only way to go for server security because the technology supplier is responsible for cybersecurity and policymakers can enforce it[22].To improve security, the platform could invest in stronger cybersecurity measures, such as encryption, multi-factor authentication, and regular security audits.

4. Discussion and Conclusions

The study reported here is the first study of the MNEMONIC digital Atlas that provides a key contribution to the understanding of a digital cultural heritage platform's ethical behavior. Ethical challenges and dilemmas are an ongoing concern in the development and implementation of digital technologies, particularly in the cultural heritage domain. Therefore, this study addresses and attributes the previously conceptualized analytical framework "Patrignani framework" and takes it a step further and uses it as a qualitative map for case analysis in the digitization of cultural heritage. The method established by Patrignani provides a relevant framework for addressing these challenges and for ensuring that ethical considerations are taken into account in the design and implementation of the current digital platforms. Following this method, the research records several ethical issues and provides clear evidence on the MNEMONIC Atlas. Some specific complications, such as accessibility issues, have been raised. This has clear implications for Atlas improvement and suggests that when access is limited for some visitors like blind people, a text-based version or/and an audio description of the Atlas is recommended to be given to vulnerable users. A key finding was that some ethical issues appear to be technologically content-related such as copyright, and privacy issues that have been raised since the strong relationship among content providers and technology designers (Figure 1). The results of this study provide four main computer ethical issues of the Atlas that following up on all issues is warranted for improving the quality of the MENMONIC platform. In addition, the study provides an evidence-based guide for researchers and professionals that are faced with computer social and ethical issues in the digitization of cultural heritage. Some questions remain; for example, an alternative scenario regards the collection of user data that makes a positive correlation between the content providers and the technology provider. However, the visitor's privacy issue was not addressed formally during the study.

Note

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