



International Initiatives and Advances in Brazil for Government Web Archiving

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Abstract. This study aimed to illustrate some government web archiving initiatives in several countries and establish an overview of the Brazilian scenario with regard to the preservation of content published on government websites. In Brazil, although there is a robust set of laws that determine the State to manage, access and preserve its documents and information, there is still no policy for the preservation of web content. The result is the erasure and permanent loss of government information produced exclusively through websites. It is noticed that there are several government initiatives for web archiving around the world, which can be used as examples for the implementation of a Brazilian policy. It is concluded that the long-term maintenance of governmental information available on the web is fundamental for public debate and for monitoring governmental actions. To ensure the preservation of this content, the country must define its policy for the preservation of documents produced in a web environment.

Keywords: Digital preservation · Websites · Web archiving · Government web archiving

1 Introduction

Contemporary society is closely inserted in the technological context, from daily routines that have become computerized, to the most complex actions using artificial intelligence. As social agents, we also interact in this scenario, as Manuel Castells had already predicted, in the 90s, when the trilogy was published “The Information Age: economy, society and culture” in which it states that the Network Society is the result of the social appropriation of a set of information and communication technologies [1]. Here we use the concept of the Network Society as Castells [1] defends: reposition of the State as the front that can boost the power that digital communications and relations are promoting with technological advances.

As a result, our social memory is also being produced as a consequence of these digital devices. After all, the Internet reflects the construction of a visual narrative: social networks are as real as relationships not intermediated by the machine [2]. In this sense, while part of our social memory has migrated to the digital environment and is printed in a database, we have to guarantee mechanisms for its preservation.

One of the challenges of the Network Society linked by digital technologies is the digitalization of the method of communications in society, which are increasingly done through commercial interests and not necessarily coinciding with the public interest [3]. What must be emphasized to understand the relationship between technology and society is that the role of the State in promoting technological innovations. The technology expresses a society's ability to boost technological dominance through its social institutions, including the state [1].

In this way, it is understood that governments should promote the transparency of their actions, through continuous accountability and the strengthening of relations between the State and society as a way of guaranteeing social memory and the full maintenance of democracy itself. Government communication is one of the main sources of information about democratic governments and governed places [4]. As well as official documents, the media content produced by the Government and disseminated especially through institutional websites, allow access to official statements and information approved by the State. For this reason, governments have a fundamental role in establishing routines to preserve this heritage that is being produced exclusively through the Internet.

The National Archive of United Kingdom (UK) says that a substantial part of your government's current records are produced only in digital format and the lack of a strategy for archiving and preserving that content will inevitably lead to the disappearance of important information for the future [5]. With the development of computer networks and the Internet, the process of producing, storing, accessing, using and consuming information has transformed the way governments treat official data [6]. In any case, regardless of the way information is produced, as a way of guaranteeing the fundamental rights of citizens, it is the duty of the State to provide access to content published on the web, especially within the scope of government websites that have critical information and are under the optics and jurisprudence of the Access to Information Law that regulates, among others, item XXXIII of article 5 of the Federal Constitution of Brazil, since everyone has the right to receive information from their public bodies of their particular interest, or of collective or general interest [7].

We understand that, in addition to making content available on government portals, it is also the duty of the State to guarantee access to this information, as a way of combating possible problems that result from the lack of preservation of web pages. Possible access problems can result from the purposeful modification of content, its deletion or technical problems such as link rot, among other issues. The official websites can be understood as places of memory of governments, as they keep news, photos, videos and documents that speak about public administrations, politics and the transformations undergone by the population [4, 8].

The web archiving is widely recognized due to its use with regard to historical, cultural and intellectual preservation. Countries with a high Internet insertion rate have established archiving initiatives to crawl and store web content, which disappears quickly and needs to be accessed for long-term use [9]. The geographic distribution of the web archiving initiatives is still unequal: in Latin America, only Chile constituted its own web archiving initiative, in which it currently has five collections. In Brazil, according Rockembach [10], there is still no systematic web archiving, covering national domains,

although there are other actions that are contributing to this increase, which will be discussed in detail below.

In search of solutions, we consider that through the web archiving, governments will be able to preserve and maintain the evidence of their services and actions, in order to make them accessible for future research purposes and also as records of the evolution of their own actions. Holub and Rudomiro [11] say that due to the dynamic nature of the web, its explosive growth, short lifespan, instability and similar characteristics, the importance of archiving it has become invaluable for future generations. According to Rockembach and Pavão [12] if there is no digital preservation of the content produced on the web, much of what was developed in this medium will be lost forever. This requires a web archiving solution that relies on structured technical policies and procedures. The National Archives, UK [13] declares that web archiving is a vital process to ensure that people and organizations can access and reuse knowledge in the long term and meet their information retrieval needs.

Here we aim to discuss the government web archiving, based on international initiatives and the current situation in Brazil. We expect that research in this field will contribute to achieving a sense of community, national identity and entrenchment among Brazilian citizens. In the sense, the implementation of a national web archiving policy, in a way, preserves information that shapes national identity through its development in political circles. The web is increasingly used as a tool for social communication and interactions between public authorities and civil society and, over time, the web archive may form a record of events that capture the nation's environment and accompany development Brazilian national identity. The preservation of these records provides a valuable source of documented heritage for current and future generations, creating a sense of community and belonging.

Discussing this theme based on the experiences of different countries in the world, provides an exchange of technical and scientific information, making the result based on positive experiences in government web archiving. Brazil, due to being inserted in the theme for a few years, needs this scientific contribution to assist in the development of studies.

2 Government Web Archiving

The websites of government agencies play an important role in the dissemination of government information to the general public, and have established themselves as fundamental tools for the search for information from public policies, in general. Considering the dynamic nature of the web, the contents of these institutional websites can change quickly and some information can be permanently removed, which may cause a break in the information scope and lead to the loss of valuable information for research and even for accountability of the actions of the government.

According to Lala and Joe [14], even the scenario of large content productions on websites and even with countless initiatives around the world that work with this perspective of preservation, there is still a long way to go before recognizing the value and the importance of archiving websites. One of the largest and most used web archives in the world, containing more than three billion URLs, is the UK Government Web

Archive (UKGWA), maintained by The National Archives, UK. The UKGWA's mission is to preserve government-owned web content in all its formats, even though its central content consists of material published by state departments [13]. These websites are identified by The National Archives and government organizations [15].

The initiative is part of a broad program by The National Archives that involves managing the British government's web heritage. In 2017, a guidance was provided to government digital teams in which questions about website management and maintenance are elucidated, in order to ensure that the government's web presence can be successfully archived and permanently accessible in the UKGWA. In "The UK Government Web Archive: Guidance for digital and records management teams", information is provided on the functioning of the websites' archiving process, the catch schedule, the limitations of what can be captured and made available through this preservation system and the circumstances in which content can be removed. The National Archives' approach to government web archiving involves remote and automatic collection of websites according to a schedule, using a crawler [16].

This process of selecting the web content to be preserved is one of the first steps that must be established when building a web archive. In archival science this process is known as appraisal; librarians call collection development. This process of web curation remains inevitable, even in the digital context [17]. Although there are technical barriers, such as storage capacity, for example, the curation process is fundamental, considering that maintaining everything is not a viable strategy for a number of reasons [17]. For web archiving, it is a selection process in which the websites that will be preserved are chosen, based on one or more criteria [18]. The development of the selection policy will also define the form of collection of the websites [19], which may include the description of the context, the intended users, access to mechanisms and the expected uses of the web archive [20].

In relation to the US government websites, two specific initiatives that are relevant to our analysis. One of the initiatives is the collaborative web archive End of Term Web Archive: US Government Websites (EOT), created since 2008 by a group of institutions that developed collections made up of federal government websites (.gov,.mil) in the legislative, executive and judicial spheres of the US government. Websites that were at risk of changing (for example whitehouse.gov) or disappearing completely during government transitions were captured. Currently, EOT is comprised of the collections of websites from the end of the Bush administration (2008) and the end of the two terms of the Obama administration (2012 and 2016). [21]. Another USA initiative that preserves government websites is the movement promoted by scientists to safeguard government information on climate change, anticipating the risk that data and information from.gov, such as EPA websites (Environmental Protection Agency) and NOAA (National Oceanic and Atmospheric Administration), could be lost or become unavailable with the transition to the new administration that was taking effect with the election of Donald Trump [22].

The initiative by the State of Sarawak, Malaysia, is a government web archiving initiative that also deserves mention. Jamain et al. [5], says that the objective of the government initiative is to preserve the evidence of web content published by departments and agencies of the public administration of the State of Sarawak, to contribute to facilitated access to information and to the provision of information to research, in addition

to being in accordance with the legislation of the State Library of Sarawak regarding the legal deposit. The capture of websites takes place every two months and, in addition to textual documents, includes the safeguarding of static images, sound recording, films and other multimedia formats made available on government portals [5].

The legal deposit has been a normative tool used to justify the need to preserve websites in some countries. Although, until the twentieth century, the legal deposit had its scope focused only on books and printed publications. In addition to the advent and massive use of sound recording, video and, in general, digital information, the scope of the legal deposit has been extended to include a variety of document formats. This proposition came from the Charter on the Preservation of the Digital Heritage, published in 2003 by UNESCO, in which it promoted the adoption of measures for the preservation of digital information, considering, for example, the possibility of using the legal deposit for materials of the web [23].

Traditionally, national libraries have the prerogative to preserve books and printed materials produced under the country's jurisprudence, a rule established by the legislation of the legal deposit. Due to UNESCO's recommendations, part of the literature on web archiving indicates that national libraries have a significant role in preserving the web [24]. This referral was positive for these organizations, especially with regard to the legal risks assumed when preserving web content. Supported by the law of legal deposit, the organization preserves its right to store, as determined by the legislation, this means that organizations, whether National Archives or National Libraries, are unique organizations, with the prerogative of preserving memory, nationally or locally [25].

In this sense, some national libraries started to build collections of websites from the early 90s [26]. These libraries started to consider web collections as a natural development of their traditional collection and as part of their duty to preserve national culture [27]. In the early 2000s, some countries added to their legal deposit laws a requirement to deposit electronic publications in online formats [28], such as Tasmania, Switzerland, Iceland and New Zealand [24]. Finland, Iceland, Norway and Sweden, for example, decided to collect local websites that meet the broad criteria of being "national" [29].

In Croatia, the National and University Library of Zagreb, in collaboration with the University of Zagreb Computing Center (SRCE) established, in 2004, from legislation, that all websites registered in the country would have a copy deposited in the Library. In 2011, the HAW (in Croatian, Hrvatski arhiv weba) or, in English, Croatia Web Archive, collected the national domain (.hr) for the first time with the intention of expanding the scope of the national collection of websites and started a thematic collection of content from web related to national events, such as the 2013 local elections for government territories [11].

Like these initiatives, there are others that promote the preservation of government websites. With these examples, it can be seen that the governmental web archiving takes place in different ways, whether from the central government's own proposals, or through articulated civil organizations or groups, or even through specific initiatives of memory places. Anyway, it is an interdisciplinary work, which involves knowledge and routines from the information sciences and technology, in which archives and libraries converge towards digital preservation, associating with the disciplines of information

technology. Each initiative has its own routines, criteria, selection processes, software and flows established according to its need to compose the web file. The responsibility of documentary collection for the public domain has been established as an important tool to preserve the official memory of several countries [30].

In addition to these areas of study that are fundamental to the web archiving, there are other disciplines and professionals that have space in the formation of knowledge related to this theme, such as the communication sciences, engineering, ethics, law and many other knowledge that can contribute to the development of the field. Universities have also understood that the Internet has increasingly been the point of origin for a large volume of information, research and scientific publications, and have turned their technological resources and their technical knowledge to the preservation of contents and scientific communications produced in this area [31].

3 Government Web Archiving in Brazil

The Brazilian Institute of Geography and Statistics (IBGE - Instituto Brasileiro de Geografia e Estatística), showed that in 2016, 116 million people were connected to the Internet in Brazil, which is equivalent to 64.7% of the Brazilian population aged over 10 yrs [32]. Likewise, CGI.br/NIC.br, Regional Center for Studies for the Development of the Information Society (Cetic.br - Centro Regional de Estudos para o Desenvolvimento da Sociedade da Informação), reported that in 2018, 67% of Brazilian households had Internet, and the percentage of network users increased to 76% of the Brazilian population [33].

The Cetic.br, in a survey in the previous year, showed that 100% of federal and state public bodies use the Internet, with 90% of these bodies having websites [34]. The Digital report “in 2020”, carried out by “We Are Social” and “Hootsuite”, shows a complete view of the digital landscape in the country: with 150.4 million Internet users - 71% of the population - the report shows that 66% of the Brazilian population is active in social networks. These figures show that more than half of the population has access to the internet and that public institutions at the state and federal levels are present on the world wide web, showing the production of digital documents, both in the social and government spheres. However, unfortunately, there is still no preservation of this content published on the web.

Brazilian law presents several points about the State’s responsibility with regard to the management, access and preservation of its documents. Among the main laws, at the level of legal hierarchy, are the Federal Constitution and Law 8,159/1991. In the Federal Constitution, article 216, paragraph 2, determines that “the public administration, under the terms of the law, is responsible for the management of governmental documentation and the measures to open its consultation to those who need it” [7]. In turn, Federal Law 8.159/1991, which provides for the national policy on archives, states in Article 1 that it is the duty of the public power “document management and special protection of archival documents, as an instrument to support administration, to culture, scientific development and as evidence and information” [35]. The same law conceptualizes that archives are “documents produced and received by public agencies, public institutions and private entities [...] whatever the support of the information or the nature of the documents”

[35]. There are dozens of Decrees, Laws, Provisional Measures, Resolutions, Ordinances and Normative Instructions, arising from these laws, which decide on the treatment of documents within the scope of public administration. Therefore, it is a matter of understanding these laws and discussing the right to access this information from the State and how much this right is guaranteed by governments.

The National Archives of Brazil, the institution responsible for drafting national management policies, excluded documents produced on the web from the scope of accepted document formats for collection at the institution, when presenting and publishing its Digital Preservation Policy, with versions in 2012 and 2016: “In the future, other more complex types of documents in digital format, such as multimedia and web pages, should also be contemplated” [36].

Recently, government websites in Brazil were the subject of the publication of Decree number 9.756/2019, which “Establishes the single portal ‘gov.br’ and provides for the unification rules of the Federal Government’s digital channels” [37], which establishes in its article that “[...] through which institutional information, news and public services provided by the Federal Government will be made available in a centralized manner” [37]. The GOV.BR Single Portal was officially launched on July 1, 2019. Before its launch, the first page of the Portal (see Fig. 1) stated that “[...] the digital channels of the Federal Government will be unified”. The single portal “[...] will gather, in one place, services for the citizen and information on the performance of all areas of the government”, and went on to say that the portal will also be “[...] the door entry of institutional pages of the federal administration, such as ministries, regulatory agencies and other bodies” [38].



Fig. 1. The first page of the GOV.BR website before its launch. 2019.

In the Brazilian academy, the web archiving subject is still recent, but it already promotes discussions on digital preservation in the national scenario. In 2017, the Federal University of Rio Grande do Sul created the Research Group on Web Archiving and Digital Preservation (NUAWEB - Núcleo de Pesquisa em Arquivamento da Web e

Preservação Digital) with the objective of investigating characteristics of web archiving through national and international initiatives, dealing with both policies and technologies involved in the process [39].

The research group studies aspects of preservation, use and access over time of digital objects made available on the web, with contributions from Archival Science, Library Science, Information Science, Communication and Computer Science. NUAWEB is developing some research projects simultaneously, such as the AWEB - Web Archiving of the Brazilian Elections; and the Brazilian Web Archiving: preservation policies and technological models. The research group also presented during the International Internet Preservation Consortium Web Archiving Conference 2019, in Zagreb, Croatia, the fundamentals to foster the discussion on Brazilian web archiving initiatives, under the website <https://www.arquivo.org.br> [40].

One of these surveys investigated the possibilities of archiving Brazilian Federal Government websites, with 23 government websites as object of analysis. The research consisted of checking the resources offered by these websites; archive the selected websites, using the Heritrix as web page crawler; rebuild archived websites using the software WABAC; and compare the resources available in the live and archived versions of selected websites. It is concluded that the websites of the Brazilian Federal Government are archivable without loss of relevant information and that the country lacks a public policy to systematize the archiving of government websites [41].

However, less than a year after the end of the research, it is possible to notice systemic changes in the analyzed websites, in terms of content and layout. In the example below is the Ministry of Defense website archived in December 2019 (see Fig. 2) and the same website in October 2020 (see Fig. 3). It is noticed that there has been a change in the layout, navigation menu and image layout. As there is still no systematic preservation of the websites analyzed, we can already say that unique information produced within the same government management has been lost.



Fig. 2. Ministry of Defense's website archived in 2019 December, 16. 2019.

In the political sphere, there is an important action regarding the web archiving under development since July 2015. This is the Bill (PL - Projeto de Lei) 2.431/2015,

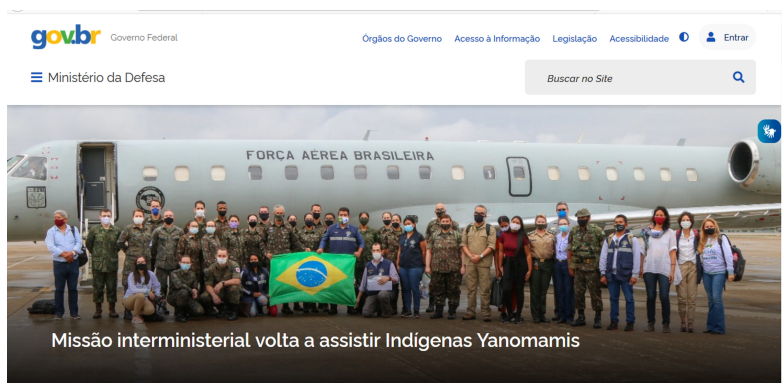


Fig. 3. Ministry of Defense's website a live. 2020 October, 20. 2020.

authored by Deputy Luizianne Lins (PT), which “Provides on the institutional digital public heritage inserted in the world wide web and other measures” [42]. In 2015, the Bill passed through the Science and Technology, Communication and Informatics Commission (CCTCI), of the Chamber of Deputies, and had an opinion for approval with a substitute given by Deputy Fábio Sousa (PSDB), who in his report presents the project considering that its approval “[...] aims to expand the protections given to public information, more specifically that stored on the internet” [42]. The report asks for changes in the wording of the project and the addition of a paragraph that states that “[...] guidelines should be established in each body or entity that guide the periodic backup copies of critical information from the environments of the official sites” [42].

Two years later, the Bill returned to discussions in the working committees of the Chamber of Deputies, this time with the Culture Commission (CCULT): in October 2017, the Bill had an opinion for the rejection made by Deputy Evandro Roman (PSD), which in its report justifies saying that the obligation to keep all the content hosted on the official government websites “[...] brings a great operational difficulty, implying increasing expenses in storage technologies, which can make the unviable preservation” [42], goes on to say that “[...] the preservation of all content ignores the dynamic character of the world wide web, which precisely facilitates the updating and dispersion of information as soon as possible for those interested” [42]. This demonstrates that the presentation of the Bill, as well as the rapporteur ships are devoid of any in-depth study on the relevance of the topic, evidencing the lack of qualified knowledge regarding the web archiving in these contexts.

In March 2019, a new rapporteur for the Bill Project was appointed at CCULT, Deputy David Miranda (PSOL), who in December of the same year presented an opinion for the approval of the Bill with a substitute, in which he adds that “[...] it is necessary arrangements for the digital content of official sites not to be deleted at the mercy of ideological positions of a candidate or another who wins the elections” [42]. The rapporteur added in his substitute, in addition to the institutional websites already provided, the social networks “[...] such as Youtube, Facebook, Twitter, etc. [...]” [42], in addition to including the personal accounts in social networks of heads of Public Authorities and

holders of maximum organs of Federal Authorities, during the exercise of their mandates, considering that “[...] these political actors are the main spokespersons of such institutions” [42].

Although the laws are clear regarding the need to preserve documents produced at the governmental level, there is an understanding on the part of the scientific community that websites are not documents that would fall within this scope. However, the lay opinion also sometimes follows this line, as can be seen in the comments of the Deputies regarding the Bill that deals with the preservation of websites. The result is the permanent erasure of digital information produced exclusively on government websites, causing an erasure of political history that could be easily accessed by a large part of the population. Have we ever wondered where is the information published on past federal government websites?

Luz and Weber [43] developed a survey of government communication available on the official website of the Presidency of the Republic of Brazil produced during the government of ex-president Michel Temer (2016–2018) and ex-president Dilma Rousseff (2010–2016), discussing the impacts of preserving and erasing government communication for the country’s political memory [43]. The conclusion is that websites have been subject to constant modifications to remove content from previous governments and difficulty in accessing certain sections or themes related to governments that are already closed, especially when the political lines do not converge with the current management.

The exclusion of content produced during previous mandates makes it evident that there is no policy in Brazil to safeguard content published on official websites, even when Brazilian law determines that it is the obligation of the public power to protect and grant access to official information [43]. This prevents society from having access to these contents, such as government actions, advertising campaigns, language, images, speeches and political positioning that guided the government actions of that administration.

From this scenario, it is understood that the implementation of a policy for the preservation of governmental web pages in Brazil is urgent, considering that part of the institutional memory published exclusively on the Internet is lost with government management changes, even though this is a great challenge, both in raising awareness about the information produced on the web, and regarding technical issues associated with the activity. Luz and Weber [43] warn that the lack of a policy to safeguard these contents in Brazil alerts to the consequences that the loss of information can have on the memory of a country, a city, its public policies and its reality.

4 Concluding Remarks

This study aimed to illustrate some initiatives of web archiving in many countries and to establish an overview of the Brazilian scenario with regard to the preservation of content published on government websites. It is noticed that there are several governmental initiatives for archiving on the web all over the world, whether promoted by the central government itself, by government agencies, or through the promotion of civil agents interested in the theme. In Brazil, although there is a robust set of laws that determine the State to manage, access and preserve its documents and information, there is still no policy for the preservation of this content, especially with regard to web documents. The

result is the erasure and permanent loss of government information produced exclusively through websites.

Since the insertion of government actions on the Internet, the web has become a democratic space for access to information, especially in Brazil, where the Internet penetration rate is high and reaches about 70% of the population. This space for communication, dissemination and storage of public information is the official website, as it provides government data and government actions, providing disclosure, as well as management's own accountability. Furthermore, when complying with demands, it becomes a space for preserving the memory of public policies in the country, respecting the principle of transparency, inherent in a democratic state. Still, the long-term maintenance of governmental information available on the web is fundamental for public debate and for the monitoring of government actions by society.

To guarantee the preservation of this content, the State should define its policy for the preservation of digital documents, including those produced in a web environment, along the lines of similar projects carried out around the world. Selecting the preservation and web archiving techniques, the appropriate technologies, the content that will be primarily archived are some of the ways that Brazil could follow to effectively implement a web archiving initiative. It is up to us, as a scientific community, to present studies to provide the preservation of this informational content produced exclusively on the web, offering possibilities for public access to be ensured and facilitated in respect of the constitutional right to memory.

References

1. Castells, M.: *A sociedade em rede - a era da informação: economia, sociedade e cultura*. fundação calouste gulbenkian, lisboa (2000)
2. Dodebei, V.: *Memória e patrimônio - perspectivas de acumulação/dissolução no ciberespaço*. Aurora – Rev. de Arte, Mídia e Política. 0(10), 36 (2011)
3. Castells, M.: *A galáxia internet - reflexões sobre internet, negócios e sociedade*. Fundação Calouste Gulbenkian, Lisboa (2001)
4. Luz, A.J., Weber, M.H.: *Comunicação governamental e memória política - preservação e apagamento de informações oficiais nos sites das capitais*. In: Abstracts of the Encontro Anual COMPÓS, São Paulo, Faculdade Cásper Líbero (2017)
5. Jamain, J., Yahya, A.L., Muhammad, N., Rahman, A., Ayob, M.: *Web archiving issues and challenges in State Government of Sarawak (Malaysia) - Do they really need their website to be archived?* In: Paper presented at IFLA WLIC 2018, Kuala Lumpur, Malaysia, Transform Libraries, Transform Societies in Session 160 - Preservation and Conservation with Information Technology (2018)
6. Pimenta, M.S., Canabarro, D.R.: *Democracia e capacidade estatal na era digital*. In: Pimenta, M.S., Canabarro, D.R. (Orgs): *Governança Digital*. UFRGS/CEGOV, Porto Alegre (2014)
7. *Brasil: Constituição da República Federativa do Brasil de 1988*, Brasília (1988)
8. Weber, M.: *Estratégias da comunicação de Estado e a disputa por visibilidade e opinião*. In: Kunsch, M. (eds.), *Comunicação Pública, sociedade e cidadania*. Difusão, São Caetano do Sul (2011)
9. Xie, Z., Sompel, H.V., Liu, J., Reenen, J., Jordan, R.: *Archiving the relaxed consistency web*. In: *Proceedings of the 22nd ACM international conference on Information & Knowledge Management (CIKM '13)*. Association for Computing Machinery, New York, NY, USA, pp. 2119–2128 (2013). <https://doi.org/10.1145/2505515.2505551>

10. Rockembach, M.: Arquivamento da Web - estudos de caso internacionais e o caso brasileiro. *RDBCI – Rev. Digital de Biblioteconomia e Ciência da Informação* **16**(1), 7–24 (2018)
11. Holub, K., Rudomino, I.: Croatian web archive - an overview. *Review of the National Center for Digitization*, 25 (2014). <https://urn.nsk.hr/urn:nbn:hr:203:894084>. Accessed 10 Oct 2020
12. Rockembach, M., Pavão, C.M.G.: Políticas e tecnologias de preservação digital no arquivamento da web. *Rev. Ibero-americana Ciência da Informação* **11**(1), 168–182 (2018). <https://doi.org/10.26512/rici.v11.n1.2018.8473>
13. The National Archives: Operational Selection Policy OSP27UK. United Kingdom: The National Archives (2014)
14. Lala, V., Joe, S.: Web Archiving At The National Library of New Zealand. Paper presented at the LIANZA Conference 2006 Papers. <https://opac.lianza.org.nz/cgi-bin/koha/opac-detail.pl?bib=113>. Accessed 20 Oct 2020
15. Espley, S., Carpentier, F., Pop, R., Medjkoune, L.: Collect, preserve, access - applying the governing principles of the national archives UK government web archive to social media content. *Alexandria* **25**(1–2), 31–50 (2014). <https://doi.org/10.7227/ALX.0019>
16. The National Archives: The UK Government Web Archive - Guidance for digital and records management teams. The National Archives, United Kingdom (2017)
17. Milligan, I., Ruest N., Lin J.: Content selection and curation for web archiving - the gatekeepers vs. the masses. In: *Proceedings of the 16th ACM/IEEE-CS on Joint Conference on Digital Libraries (JCDL '16)*. Association for Computing Machinery, New York, NY, USA, pp. 107–110 (2016). <https://doi.org/10.1145/2910896.2910913>
18. Niu, J.: An overview of web archiving. *D-Lib Mag.* **18**, 3–4 (2012)
19. Bragg, M., Hanna, K., Donovan, L., Hukill, G., Peterson, A.: The Web Archiving Life Cycle Model. *Internet Archive* (2013). https://ait.blog.archive.org/files/2014/04/archiveit_life_cycle_model.pdf. Accessed 01 Oct 2020
20. Khan, M., Rahman, A. Ur.: A systematic approach towards web preservation. *Inf. Technol. Libr.* **38**(1), 71–90 (2019). <https://doi.org/10.6017/ital.v38i1.10181>
21. EOT (2019). <https://eotarchive.cdlib.org>. Accessed 21 Sep 2020
22. VICE: https://www.vice.com/en_us/article/d7yeej/all-references-to-climate-change-have-been-deleted-from-the-white-house-website-5886b75d0b367c453f87dd14. Accessed 21 Sep 2020
23. UNESCO: Charter on the Preservation of Digital Heritage (2003)
24. Shveiky, R., Bar-Ilan, J.: National libraries' traditional collection policy facing web archiving. *Alexandria* **24**(3), 37–72 (2013). <https://doi.org/10.7227/ALX.0001>
25. Rockembach, M.: Inequalities in digital memory - ethical and geographical aspects of web archiving. *Int. Rev. Inf. Ethics* **26** (2017). <https://informationethics.ca/index.php/irife/article/view/286>
26. Day, M.: Preserving the fabric of our lives: a survey of web preservation initiatives. In: Koch, Traugott, Sølvsberg, Ingeborg Torvik (eds.) *ECDL 2003*. LNCS, vol. 2769, pp. 461–472. Springer, Heidelberg (2003). https://doi.org/10.1007/978-3-540-45175-4_42
27. Lazinger, S.: *Digital preservation and metadata - history, theory, practice*. Libraries Unlimited, Englewood, Colorado (2013)
28. Hakala, J.: Archiving the web - european experiences. *Program: Electron. Libr. Inf. Syst.* **38**(3), 176–183 (2004). <https://doi.org/10.1108/00330330410547223>
29. Day, M.: *Collecting and Preserving the World Wide Web - A Feasibility Study Undertaken for the JISC and Wellcome Trust*. University of Bath, United Kingdom, UKOLN (2003)
30. Tosh, J.: *The Pursuit of History*, 3rd edn., pp. 76–83. Pearson Education, London (2002)
31. Ferreira, L.B., Martins, M.R., Rockembach, M.: Usos do arquivamento da web na comunicação científica. *Prisma.com*, **36**, 78–98 (2016)

32. IBGE (2018). <https://www.ibge.gov.br/estatisticas/sociais/populacao/9171-pesquisa-nacional-por-amostra-de-domicilios-continua-mensal.html?=&t=o-que-e>. Accessed 10 Oct 2020
33. CGI.br (2018). <https://cetic.br/tics/domicilios/2018/individuos>. Accessed 10 Oct 2020
34. CGI.br (2017). <https://cetic.br/pesquisa/governo-eletronico>. Accessed 10 Oct 2020
35. Brasil: Lei Federal 9.159/1991. Dispõe sobre a política nacional de arquivos públicos e privados e dá outras providências, Brasília (1991)
36. Arquivo Nacional do Brasil: Política de preservação digital, Versão 2, Rio de Janeiro (2016)
37. Brasil: Decreto nº 9.756, de 11 de abril de 2019 - Institui o portal único “gov.br” e dispõe sobre as regras de unificação dos canais digitais do Governo federal. Diário Oficial [da] República Federativa do Brasil, Poder Executivo, Brasília, DF, 11 Abr (2019)
38. Gov.br (2019). <https://www.gov.br>. Accessed 10 Oct 2020
39. NUAWEB (2019). <https://www.ufrgs.br/nuaweb/>. Accessed 20 Oct 2020
40. Rockembach, M., Melo, J.F.: Web archiving of Brazilian websites. Paper presented at the IIPC WEB ARCHIVING CONFERENCE 2019, Zagreb, Croatia. Abstracts & presentations.... Drop-in Talks & Drop-in Slides (2019)
41. Melo, J.F.: Arquivamento dos websites do Governo Federal Brasileiro - preservação do domínio GOV.BR. Dissertação. 133 f. Porto Alegre: Universidade Federal do Rio Grande do Sul (2020)
42. Brasil: Projeto de Lei 2431/2015. Dispõe sobre o patrimônio público digital institucional inserido na rede mundial de computadores e dá outras providências, Brasília (2015)
43. Luz, A.J., Weber, M.H.: A memória política do Brasil no site da presidência - acesso e desvios da comunicação dos governos de Dilma Rousseff e Michel Temer. Liinc Em Revista, **15**(1) (2019). <https://doi.org/10.18617/liinc.v15i1.4571>