

# DIGITAL EFFECTS-BASED TRANSFORMATIONS IN HERITAGE PRACTICES AND KNOWLEDGE WORK<sup>1</sup>

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## **ABSTRACT**

*The rapid spread of IT has brought major changes in the development of society. Investigations in the business sector enable us to discuss new conceptualizations of heritage as well as changes in how heritage functions in society and heritage practices and knowledge work in the overall context of digital culture. In this context, heritage is contemporized: it functions not so much as knowledge of the past, but more like an element of present culture. Thus the line is being erased between heritage (which belongs to the past and represents past culture) and contemporary culture. This article discusses elements of digital culture that are important for heritage practices and knowledge work: textuality and visuality, openness and closedness, textual and object-oriented approaches, concentration and decentralization, expertness and crowd-sourcing, static nature and interactivity, one-directional communication and participation, gamification, and so forth.*

1 This article was prepared as part of *CA COST Action CA15201 "Archaeological practices and knowledge work in the digital environment"*. The article is based on the lecture "Heritage as the present: cultural heritage transformations in the digital culture" which was given at the University of Zadar Conference and School on Authority, Provenance, Authenticity, Evidence in October 2016.

## Introduction

Information Technologies (IT)<sup>1</sup> that were developed at the end of the 20<sup>th</sup> century created new opportunities in many fields of application. But more importantly, the rapid spread of IT caused major changes in the development of society. In scholarly research discussing the impact of digital IT on heritage practices and knowledge work, their technological value is normally emphasized – the use of digital hardware and software. Far less attention is paid to the social aspects of the impact of IT. Such an approach (technology “exaltation”) is not a sufficiently accurate representation of changes in social realities that happened in the last decade and can become the reason for inaccurate and incorrect decisions of a strategic or tactical nature. Sometimes we get the impression that in heritage sector projects, goals and social context are perceived superficially and projects are treated as a way to obtain project funds. The implementation of ideas is limited to the transfer of heritage objects to digital space, the creation of games in the style of a “test” or “puzzle”, and the “placement “ of IT tools (e.g., touch screens) in museum exhibitions, under the assumption that such decisions by themselves will automatically make heritage attractive to a modern person. Unfortunately, in most cases this does not happen and parts of the projects, according to John Palm, become “black holes”.<sup>2</sup>

Analyzing the impact of digital technologies on the heritage sector, we should pay attention to a slightly different, less technologized chain of reasoning: from IT development to a society changed because of IT impact to heritage practices and knowledge work in and for this changed society. It is interesting that these changes (in the sense that “something is wrong”) were addressed through the work of lot of scientists and business consultants at the end of 20<sup>th</sup> – beginning of 21<sup>st</sup> centuries (e.g., applying the

1 The synonymous term “Information and communication technologies” is also used in these contexts. The difference between “information” technologies and “communication” technologies could be perceived, however, as the difference between previous digital information management (e.g., digital computing) and analogous communication (e.g., analogous TV or telephony) technologies. This difference isn’t important now, when all technologies are digital.

2 Jonas Palm. “The Digital Black Hole”. *Training for Audiovisual Preservation in Europe*, 2005, [http://www.tape-online.net/docs/Palm\\_Black\\_Hole.pdf](http://www.tape-online.net/docs/Palm_Black_Hole.pdf).

concepts of “experiences economy”,<sup>3</sup> “the cultural turn”,<sup>4</sup> “post-modern society”<sup>5</sup> and “post-post modern society”<sup>6</sup> or “BRANDchild”<sup>7</sup>). However, only a few researchers related their changes to the social impact of digital IT, and in this context of changing societies, perhaps the most important are the works of Manuel Castells. According to Castells, the end of the 20<sup>th</sup> century – beginning of the 21<sup>th</sup> century can be seen as a kind of “breaking point”, the transition between the old “industrial” and the new “network” society.<sup>8</sup> These changes could be compared with the processes that took place in Europe in 15<sup>th</sup> – 19<sup>th</sup> centuries. In those times, in different countries at different points, the old, agrarian (pre-industrial) society began to crumble and the formation of a new “industrial” society began to form. Technologies based on human and animal power, well-being based on land management, and class society organized hierarchically according to origin were changed by technologies based on steam, electricity and the internal combustion engine. In both pre-industrial and industrial societies well-being was created based on added value and society was organized hierarchically, according to economic characteristics (property). These changes, which lasted more than 400 years, affected all economic, political and cultural processes of Europe and the world. Modern changes, where mechanical machines are changed by digital devices, the highest added value is created in the information and services sector, and society is “flattened”<sup>9</sup> and the world is turned into a “global village,”<sup>10</sup> are much faster. They fit chronologically into a person’s life and create additional tensions

- 3 Joseph B. II Pine and James H. Gilmore. “Welcome to the Experience Economy”. *Harvard Business Review*, July-August issue (1998), <https://hbr.org/1998/07/welcome-to-the-experience-economy>.
- 4 Fredric Jameson. *The Cultural Turn: Selected Writings on the Postmodern*. Brooklin: Verso, 1998.
- 5 Mark Jacobs and Lynette Spillman. “Cultural sociology at the crossroads of the discipline”. *Poetics* 33.1 (2005): 1–14.
- 6 Joel Bakan. *The Corporation: The Pathological Pursuit of Profit and Power*. New York: Free Press, 2004.
- 7 Martin Lindstrom. *BrandChild: Remarkable Insights into the Minds of Today’s Global Kids and Their Relationship with Brands*. London: Kogan Page Publishers, 2004.
- 8 Castells, Manuel. *The Information Age: Economy, Society and Culture*. Trilogy, Vol. I-III, “The Rise of the Network Society”, “The Power of Identity”, “End of Millennium”. Cambridge, MA; Oxford, UK: Blackwell, 1996-1998.; Castells, Manuel. *Communication power*. Oxford/New York: Oxford University Press, 2009.
- 9 Thomas Friedman. *The World is Flat*. New York: Farrar, Straus and Giroux, 2005.
- 10 Marshall McLuhan. *The Gutenberg Galaxy: The Making of Typographic Man*. Toronto: University of Toronto Press, 1962.

in studies and labor markets and in so-called “generation conflicts”<sup>11</sup>

In this context, IT are new and beneficial means to implement heritage communication, but the interpretation of heritage itself and communication can occur equally in the real world and in the virtual space. The success of this communication depends not so much on the use or non-use of IT, as on the specific features of the changed world and awareness of the information behaviors of modern (networking) people. This means that heritage interpretations executed in both the virtual and the real world and heritage communication products which are being created will be used in contemporary culture, not according to how much IT will be applied in them, but according to the extent to which they correspond with the world-view and needs of a changed society.

The main problem that is explored in this discussion article is the idea that the coordination of new opportunities and needs is particularly important for the public sector (i.e., state-funded or non-profit organizations serving the needs of the public) heritage preservation, communication and memory institutions (e.g., museums, archives), whose direct function is the provision of heritage and information services to the public. These services are understood as an activity or benefit that public sector institutions can offer to the public. They are intangible and cannot become a property. Thus, in terms of heritage practices and knowledge work, society invests funds in order for certain real objects to be selected and preserved in order to use them further in the culture. In terms of the relationships between society and memory institutions, it is important that society, transformed by the impact of IT from an industrial society into a networking society, promotes change within heritage preservation institutions, museums, archives and libraries that addresses the needs of the new, networking society.

In the face of this challenge, quite a big part of the professional community (not only in the academic community, but also among heritage professionals, politicians, businessmen and others engaged with culture) is lost. Many of the theorists dealing with the application of digital

11 William Strauss and Neil Howe. *Generations: The History of American's Future, 1584 to 2069*. New York: Morrow, 1991.

technology in heritage practices and knowledge work still think in the way people thought in industrial society. For them the computer is not a reality-changing instrument, but rather only one more “new machine” that considerably increases productivity. Applied models, methods, habits, concepts, and characteristics of the industrial society that were active and helped, several decades ago stopped working or do not work like they used to. Digital technologies are often accused “per se” of preventing them from working and “active resistance” actions are taken. However, when “fighting” for or against technologies, we often do not notice what is going on “beyond the technologies”. When trying to look at the changes which took place at the junction of the 20<sup>th</sup> – 21<sup>st</sup> centuries, we can see that the rhetoric of opponents and proponents of digital technologies are somewhat similar to a century-old rhetoric about benefits and risks of a car (e.g., the Locomotive Act, active in Great Britain from 1865 to 1896, required that when the vehicle drove in the city, there had to be a man with a red flag going in front of it). Humanity’s past shows that we are social, communicative beings; therefore, the inventions that facilitate communication usually overcome the prohibitions. In this case vehicles were stronger than “the man with the flag”. How will digital IT evolve and change the world?

The main objective of this discussion article is to debate the impact of digital effects on transformations in heritage practices and knowledge work. In a sense it is a continuation of the debate on the nature of scholarship in the digital environment that began at the end of the 20th century<sup>12</sup> and the many discussions of a “futurological” nature that take place nowadays.<sup>13</sup> This discussion article aims more to summarize the current trends, discuss the possible “vectors of alternation” in heritage practices and knowledge work, and raise questions, than to provide the final answers, because “good questions create new territory of thinking”.<sup>14</sup>

12 E.g. Costis Dallas. “Humanistic research, information resources and electronic communication”. In *Electronic Communication and Research in Europe*, edited by J. Meadows, H. D. Boecker, 209–239. Luxembourg: European Commission, 1999.

13 Peter Robinson, Paul Turnbull, Alan Liu and Willarad McCarty. “Research Futures”. In *Advancing Digital Humanities*, edited by P. Longley Arthur, K. Bode, 243–322. New York: Palgrave Macmillan, 2014.

14 Kevin Kelly. *The Inevitable*. New York: Viking, 2016, 288–289.

## Technology and Society: The Concept of Digital Culture

Different researchers define interconnections between technologies and society according to different theoretical concepts. One type of discourse is more focused on technological dimensions (e.g., the internet and 3D, augmented, extended or virtual realities). The typical example of these concepts could be the discourse of “technology transfer”, which describes the processes of transferring technology from the places and groups of its origination to wider distribution among more people and places<sup>15</sup> – a strategic variable for companies and nations coping with these challenges in a global economy.<sup>16</sup> Another type of discourse puts more focus on the cultural or even philosophical (e.g., the concepts of “chaosmosis”<sup>17</sup> or “semiosphere”<sup>18</sup>) societal dimensions. Between both these discourses we can find a lot of “techno-communicative” ideas, theories and models that explain relationships between technology and society, such as innovation diffusion<sup>19</sup> or cultural innovation filters.<sup>20</sup>

In the context of this article there can be a viable model of interaction between technologies and society, according to which technology and social interaction can be described as a dynamic transformation happening in space and time, ongoing “from curiosity to necessity” (similar to the Gartner Hype Cycle for Emerging Technologies idea<sup>21</sup>). The starting point of these transformations can be called the emergence of technology (Gartner’s “Technology Trigger”) and its end point – the moment when the majority of society cannot imagine life without this technology (Gartner’s “Plateau of Productivity”). Unlike the Gartner Hype Cycle which is more linear, unified

15 Robert Grosse. “International Technology Transfer in Services”. *Journal of International Business Studies* 27.4 (1996): 781-800, doi:10.1057/palgrave.jibs.8490153.

16 David B. Audretsch, Erik E. Lehmann and Mike Wright. “Technology transfer in a global economy”. *The Journal of Technology Transfer* 39.3 (2014): 301–312, 2017, doi: 10.1007/s10961-012-9283-6.

17 Felix Guattari. *Chaosmosis an ethico-aesthetic paradigm*. Bloomington: Indiana University Press, 1995.; Rafal Ilnicki. “Technicyzacja jako wirtualizacja kultury w perspektywie ontologii wirtualności”. In *Wirtualizacja. Problemy, wyzwania, skutki*, edited by L. Zacher, 355-376. Warszawa: Poltext, 2013.

18 Yuri M. Lotman. “On the semiosphere”. *Sign Systems Studies* 33.1 (2005): 205-229, [http://www.flfi.ut.ee/sites/default/files/fl/lotman\\_2005\\_on\\_the\\_semiosphere.pdf](http://www.flfi.ut.ee/sites/default/files/fl/lotman_2005_on_the_semiosphere.pdf).

19 Everett M. Rogers. *Diffusion of innovations*. New York: Free Press of Glencoe, 1962.

20 E.g. Keith Goffin and Rick Mitchell. *Innovation Management: Strategy and implementation using the pentathlon framework*. New York: Palgrave Macmillan, 2010: 17.

21 “Gartner Hype Cycle”. *Gartner Inc.*, 2017, <http://www.gartner.com/technology/research/methodology/hype-cycle.jsp>.

and clearly limited in time, the interaction of technology and society “from curiosity to necessity” is more based on networked and dynamic interconnections between many variables: the technology, the historical period, state policy, public cultural patterns, and so forth. For example, in 1885-1886 the car was designed “as a curiosity” but it became “a necessity” in Lithuania only in ~1998-2000. Meanwhile, in 1974-1976 personal computers appeared in Lithuania, but only became “a necessity” in 2005-2007.

In such a context of networked interaction between digital technology and public, the new phenomenon of digital culture is formed. This article follows the classic (known since ancient times<sup>22</sup>) concept of culture, relating it with human intellectual and physical activity and, thus, delimiting it from nature (lat. “natura”). In this context, culture is everything that is created by human hands and mind (what does not come from nature, is not natural). Therefore, digital culture includes all things (as in the meaning of Thing within CIDOC-CRM<sup>23</sup>), created by human hands and mind through digital technologies (digital artefacts) and phenomena encouraged by these digital artefacts. At this point it should be noted that, when speaking in the contexts of digital culture, we need to refuse the attitude of treating the “virtual” (digital) world and the physical (not-digital) reality, as an opposition between “false” and “real” worlds. We should instead perceive all elements (digital, virtual and real) as different in terms of their technologies and media (e.g., the digital world is discrete and the physical world continuous) but tangled in the same blended elements of reality.<sup>24</sup> The start of digital culture’s formation can be defined chronologically differently in each country or region, through when digital technologies become “a necessity”. This can be formally measured by the penetration of computers into households of particular countries, establishing the criterion for “necessity” as being when “more than 50 percent households have computers”.

22 David J. Greenwood and William A. Stini. *Nature, Culture, and Human History*. New York: Harper and Row, 1977.

23 CIDOC-CRM. Definition of the CIDOC Conceptual Reference Model, Version 6.2.2. ICOM/CIDOC CRM Special Interest Group, 2017: 33, [http://www.cidoc-crm.org/sites/default/files/2017-01-25%23CIDOC\\_v6.2.2\\_esIP.pdf](http://www.cidoc-crm.org/sites/default/files/2017-01-25%23CIDOC_v6.2.2_esIP.pdf).

24 Lech W. Zacher. “Człowiek utecniczony i zwiirtualizowany w hybrydowym świecie”. In *Wirtualizacja. Problemy, wyzwania, skutki*, edited by L. Zacher, 111-128. Warszawa: Poltext, 2013.

## The General Model of Societal Evolution

The general model of societal evolution was developed as part of the investigations of the Dubingiai microregion (1<sup>st</sup>-16<sup>th</sup> century AD) in Lithuania.<sup>25</sup> The model's theoretical basis is in accordance with Ilya Prigogine's systems theory approach, which states that social structures and organizations are open evolving systems.<sup>26</sup> But unlike continuous evolution (based on Charles Darwin's ideas), Prigogine's systems theory states that each system goes through periods of continuous development (the predicted evolution) and sudden shock periods (unpredictable mutations). Each mutation can lead to both positive and negative changes in the systems, and the strength of the impact of mutations on the system depends on its "saturation". The system becomes dependent on mutation (vulnerable), not so much due to external, but more to internal reasons. During every period (equivalent to evolution and mutation) the system changes at a different speed, but only during continuous evolution are the changes predictable. According to Prigogine, the changes that occurred during evolution and mutation take place in accordance with an objective time arrow and the changes and the processes in the system are irreversible.

According to Prigogine's systems theory, two public "life-cycle" periods – continuous development and mutations – constitute one cycle in societal development. The beginning of a cycle can be considered to be the first manifestations of mutagenic factors in a society that is open for change, and the end of the cycle – the final stage of societal evolution – comes when it again becomes open for change. While modelling societal evolution during the continuous development period, it was assumed that population size is one of the most important social system parameters.<sup>27</sup> Therefore, population size was selected as the starting point for the process, and popu-

25 Albinas Kuncevičius, Rimvydas Laužikas, Rimantas Jankauskas, Renaldas Augustinavičius, Ramūnas Šmigelskas. *Dubingių mikroregionas ir Lietuvos valstybės ištakos*. Vilnius: Petro ofsetas, 2015.; Jurgita Lapienytė, Marius Jokūbaitis. "Ką verslūs lietuviai padarė iš „Uber“: veikia kaip taksi su „centriuku“". *15 min*, March 5, 2017, <http://www.15min.lt/verslas/naujiena/transportas/ka-verslus-lietuviai-padare-is-uber-veikia-kaip-taksi-su-centriuku-667-762942>.

26 Ilya Prigogine and Isabelle Stengers. *The End of Certainty*. New York: Free Press. 1997.

27 Colin Renfrew and Paul Bahn. *Archaeology: Theories, Methods and Practice*. London: Thames & Hudson, 1991: 421.

lation growth was recognized as the main stimulating force of the evolution process, which according to theoretical calculations during historical times (up to the end of the Middle Ages) was on the average 0.1 percent per year,<sup>28</sup> while at the end of the 20<sup>th</sup> century population growth even reached 3-7 percent per year in some countries.<sup>29</sup> The trends of diminishing societal evolution cycles can be partly explained by the acceleration of population growth. It should be noted that, according to the general society “life cycle” theoretical model, population number is not only a starting point, but also the result of the whole cycle, i.e., at the end of the cycle (when the system is stabilized after mutation) the new cycle must begin with a changed (compared with the end of previous cycle) demographic situation (“demographic leap” or “demographic decline”), which stimulates the repetition of the modelled cycle at a qualitatively different level (basically a spiral), when population number is once again evenly growing.

According to Prigogine, during the periods of continuous evolution of the system – the population growth stimulates continuous economic development, as a growing community needs more resources (food, fuel, etc.), bigger living space, and so forth. We can assume that firstly the development is carried out inwardly by using internal community resources. Therefore, sooner or later the extensive development opportunities had to be exhausted, and a certain limit would be reached when there would be “saturation” of society as the system declines, because it cannot adequately respond to challenges and becomes open to changes (society is weak, vulnerable to the external mutation factors). Under these circumstances, the society from the previous evolution cycle of continuous development period goes into the new development cycle – a period of mutation. Due to the internal features of the system (low “saturation”), it is “shaken” by “mutagenic factors” – characteristic of a specific area and specific time. Because of the complex mutagenic effect, the society goes through a “shock phase” – it changes quite fast. During the stabilization ([self] stabilization) phase the mutational changes are “reinforced” and they become

28 Ibid.: 400.

29 World Population to 2300. New York: United Nations, 2004: 41, <http://www.un.org/esa/population/publications/longrange2/WorldPop2300final.pdf>.

part of the system (self). There is an assumption in the model that the first link, where mutational changes occurred in historical times and were reinforced, was the economy. This model describes the social development through social capital theory,<sup>30</sup> where the two most important elements of the social structure are personal relations and social interactions. Personal relations – frozen social capital – is an interrelation of two or more persons, based on commonality, love, solidarity, professional interaction, etc. Social interactions – activated social capital – are common acts of two or more people, practices or any other behaviors intended to affect or co-ordinate the experience or intentions of other persons or groups. Mutational and economic changes cause changes in personal relationships and social interactions. Therefore, the new social structure emerges through territory divisions, the emergence of new centers, other territorial structures, formation of road networks, etc. Finally, changes that took place are reinforced through worldview and religious reform. Religion here acts as “social glue”, it restores the social capital level reduced during the mutation period and makes the society once again resistant to mutagenic factors, thus beginning the new period of continuous development.<sup>31</sup>

The application of the model created according to historical research can be limited for modern society. However, we can justify the application possibilities of this model by the argument that the main component of the model – population change – is recognized as one of the most important contemporary challenges and a factor in global problems in various contexts (society aging, migration, distribution of resources, environmental protection, etc.). However, when talking about the performance of the model in today’s society, we must note that in “linearity vs. networking discourse” (later this issue is addressed in more detail), not all levels of the “mutation period” could be investigated similarly. We can assume that in modern society, the model does not function in such a linear, chronological way (from economic changes to the “new religion”), as it at least partly did in past societies, and the relationship between the model components

30 Pierre Bourdieu. “The forms of capital”. In *Handbook of Theory and Research for the Sociology of Education*, edited by J. Richardson, 241-258. New York: Greenwood, 1986.

31 Daniel B. Lee. “Ritual and the Social Meaning and Meaninglessness of Religion”. *Soziale Welt* 56.1 (2005): 5-16.

in modern times is not so much linear (linear character sequence) as it is networked, when a “jump” is possible from one element to another, bypassing some of the intervening elements. For this reason, the functioning of the model in this article is illustrated as a bit fragmented. Some elements of the model are disclosed more accurately while others are less visible.

Discussing digital effects-based transformations in heritage practices and knowledge work we can assume that the current period is the “mutation” stage as presented in the general model of societal evolution. In this case, we can formulate the hypothesis that the differences of past (industrial society) and future (network society) can be seen in modern conflicts, which can be seen as “new” and “old” junction markers (certain “markers of changes” between industrial (“past”) and network (“future”) societies).<sup>32</sup> Empirical analysis of these conflicts makes it possible to at least partially understand the changes taking place in society, present and future challenges, and some of the possible development trends, as well as to “draw the vectors” of future heritage practices and knowledge work, which could be expressed as metaphors. According to this approach, the research pattern (based on the general model of societal evolution) could be designed. Therefore the model’s application and pattern is reminiscent of Mendeleev’s periodic table patterns – in which some cells are left empty in the hope that they will be filled or not filled in the future by simultaneously questioning or verifying the model. Some ideas presented in this pattern have been developed (especially on a philosophic level) before the spread of digital technologies. Such trends only strengthen the arguments about the process of interactive interaction of technology and society (which basically is a “chicken and egg dilemma”), where on the one hand, technologies change society, and on the other, ideas that spread in society have an impact on the emergence of new technologies. Furthermore, the application of this model does not mean a goal to accurately predict the future reality. It is more about identifying trends, which are close to Kevin Kelly’s “inevitable” ideas.<sup>33</sup>

32 The examples of these conflicts could be: French taxi drivers’ anti-Uber strikes; the lawsuit of Google Books; cautions about social networking and the information wars waged by ISIS and Russia; discussions about the future of printed books; concerns about the reading skills of millennials and so forth.

33 Kelly, *The Inevitable*.

## *1<sup>st</sup> Conflict: from Ownership to Sharing Economy*

Karl Marx, in his theory of capitalism, formulated the class society concept,<sup>34</sup> which is clearly visible in industrial society. In a wider context of “class”, as a social group, there is a distinct divide in the industrial society between the minority that has some form of power and the majority that has not: the factory owner and his workers, politician and voters, teacher and students, writer and readers, the bus driver and passengers, experts and the general public, and “market old-timers” and “market beginners”. In this society, we find stable hierarchical structures on top of which is an “outstanding” person or group of persons with the power to execute over “lower” levels.<sup>35</sup> Meanwhile, in the digital culture that is formed in a networking society, according to Thomas L. Friedman, “the world is flat”.<sup>36</sup> Social networks and blogs enabled every individual to become a writer, editor and publisher, Uber – taxi driver, You Tube – screenwriter, director, cameraman, actor, Spotify – the owner of incredible amount of music collection, Airbnb – the hotel manager. Such terms appeared as “open access”, “open source” and the “sharing economy”.<sup>37</sup> Immediately there were conflicts, ranging from taxi drivers protesting Uber<sup>38</sup> and the reaction of institutionalised business towards the “sharing economy” to government “resistance” by criminalizing the “sharing economy” and its related activities, clearly identifying them as “piracy” and “tax evasion”. The axis of these conflicts is the “flattening of the world” (i.e., of the power division between those who had it and those who wish to acquire it). However, “official” discourse more often relies on the attempt to maintain “an industrial status quo” rather than looking for sustainable decisions based on new models that create additive values. One such interesting attempt to maintain “an industrial status quo” is an attempt of institutions to “take over”

34 Karl Marxl. *Das Kapital: Kritik der politischen Oekonomie*. Hamburg: Verlag von Otto Meissner, 1867.

35 Michel Foucault. *Discipline and Punish: The Birth of the Prison*. New York: Random House, 1975.

36 Friedman, *The World is Flat*.

37 Alex Stephany. *The Business of Sharing: Making it in the New Sharing Economy*. New York: Palgrave Macmillan, 2015.

38 Angélique Chrisafis. “France hit by day of protest as security forces fire teargas at taxi strike”. *The Guardian*, January 26, 2016. <https://www.theguardian.com/world/2016/jan/26/french-taxi-drivers-block-paris-roads-in-uber-protest>.

the sharing economy by using the ideas and tools of this economy to improve their ordinary activities (e.g., the Uber case in Lithuania<sup>39</sup>). Another approach is a juridical fight against the elements of sharing economy. An example of this type of conflict, and perhaps the most noticeable in the public arena, was the so-called Google Books case – a dispute on the relationship between the author’s intellectual property and open access, and the main question – whether Google Books is the so-called illegal “pirate” site. In 2016 the US Supreme Court “put an end” to this case, stating that the Google Books project does not infringe intellectual property rights, and upholding the 2015 decision that highlights the Google Books project as important for the development of society, and encouraging creativity and scientific progress.<sup>40</sup> The outcome of this conflict shows the declining tendencies of hierarchical power structures typical of old industrial society as well as the fact that every member of society gets increasingly more options and that public benefit (welfare) is valued more than the interests of one person or a small group of persons (which stand on the higher hierarchy). On the other hand, the traditional “piracy” (copyright infringement) concept<sup>41</sup> inherited from industrial society is being questioned and people are encouraged to search for new creative products (music, movies, software, books, etc.) and business forms that are based not on the object, but rather on the selling of services (cf. cloud computing) or models typical for participatory economics.<sup>42</sup> At the same time, it means that more and more additional value is created not through ownership, but through sharing; not by experts, but by “crowds” using participatory means (interestingly enough, even large IT companies, such as Microsoft, are investing in open source software, not seeking to make claims to it).<sup>43</sup>

39 Lapienytė and Jokūbaitis, “Ką verslūs lietuviai padarė iš „Uber“?”.

40 Adam Liptak and Alexandra Alter. “Challenge to Google Books Is Declined by Supreme Court. *New York Times*, April 18, 2016, [https://www.nytimes.com/2016/04/19/technology/google-books-case.html?\\_r=0](https://www.nytimes.com/2016/04/19/technology/google-books-case.html?_r=0).

41 Darrell Panethiere. “The Persistence of Piracy: The Consequences for Creativity, for Culture, and for Sustainable Development”. *UNESCO e-Copyright Bulletin* July-September (2005), [http://portal.unesco.org/culture/en/files/28696/11513329261panethiere\\_en.pdf/panethiere\\_en.pdf](http://portal.unesco.org/culture/en/files/28696/11513329261panethiere_en.pdf/panethiere_en.pdf).

42 “Participatory Economics is a model for a new economy”, <http://www.participatoryeconomics.info/>; Nina Simon. *The Participatory Museum*. Santa Cruz: Museum 2.0, 2010, <http://www.participatorymuseum.org/read>.

43 “TheNextWeb”, <http://thenextweb.com/microsoft/2016/09/15/in-your-face-google/>.

How do all these vectors operate in heritage practices and knowledge work? First of all, the “struggle for intellectual property” encourages reviewing the “digital copy” and “digital surrogate” concepts that are used in digitization field. These conceptual frameworks were formulated at the various stages of digitization, mainly in order to transfer the author’s intellectual property rights of analogue creation to the digital document. For this question, the most interesting is point of view, based on Prigogine’s systems theory about evolving systems.<sup>44</sup> It means that the process of digitization is not the process of copying or creating surrogates, but rather the process of decoding from analogue reality to the discrete digital environment. During this decoding process the object’s level of structuring increases, but unavoidably some information is lost (e.g., the information is lost in a scanned historical document about the chemical composition of the paper). The result is not a copy or a surrogate, but a new object of reality with a different nature, based on different technology and with a different life cycle. In the processes of digitization, the relationship between analogue reality and discrete digital environment could be called emulativity (as a specific activity where people create emulative systems in a digital environment, emulating and imitating the activity of natural systems operating in the physical environment). But it is important to note that emulative systems are not copies of systems existing in reality, but are as independent, dynamic and freely evolving (perdurant<sup>45</sup>) as the systems of reality that they emulate. On the other hand, the emulative digital objects work as some kind of extensions of reality (such as the augmented reality concept). Moreover, in this context, the line between popular “digitized” and “born digital” concepts is disappearing, which, at least in part, de-

44 Prigogine and Stengers, *The End of Certainty*.

45 Endurantism and perdurantism are two opposing philosophical theories investigating the persistence of objects with regard to time that were formed during the last decades of the 20th century. Endurantists affirm that objects are three-dimensional entities that have spatial parts and wholly exist at each moment of their existence. Perdurantists affirm that objects are four-dimensional entities (the fourth dimension and component of objects is time) and they exist at each moment of their existence only partially. The origin of these philosophical theories may be linked to Einstein’s general and special relativities. Endurantism is more suitable for Newton’s descriptive space of physics and it is problematic in the description of Einstein’s space-time objects (see more at Hales, Steven D., Johnson Timothy. “Endurantism, Perdurantism, and Special Relativity”. *The Philosophical Quarterly* 53.213 (2003): 524-539. Accessed April 20, 2017. <http://departments.bloomu.edu/philosophy/pages/content/hales/articlepdf/endurantism.pdf>).

veloped also as intellectual property for regulatory purposes. Structurally both “digitized” and “born digital” documents are the same emulations of reality, and their differences can be reduced to different trans-media migration options when the “digitized” object has these options (the book scanned and presented in .pdf format may again be printed without significant loss of information), and “born digital” – usually does not (GIS data array may be printed as a usual map, but, in this case, it will lose all the functionality provided by digital GIS).

The second important issue is related to the creating of additional values through sharing. One of the essential features of many digital heritage systems is the “limitation” of content to users (the bigger part of provided visual content is low resolution, “protected” by watermarks, with superficial metadata, etc.). On the other hand, metadata in different countries are treated in different ways as intellectual property objects, intellectual property licenses are interpreted differently (e.g., Creative Commons), and so-called “orphan works” as well as the so-called “orphans” create problems. This is a serious obstacle for sharing and reusing digital heritage information and creating additional values via “sharing economy” models. In this case, in the networking society the most acceptable could be an open source model and approach where the results of the projects (which were paid for by the public sector) must be free from any restrictions, limitations or extra charges and available to the public for educational, entertainment, business and all possible other reasons, because, first of all, users (through the tax system) have already paid for these products. On the other hand, non-commercial and commercial use [re-use] of digital content without any limitations increases business profits and contributions to the state budget, and add value to other forms of capital, which also means greater “public good” and public finances – the only one useful way to grow the reusing of digital content.

This different approach to creating additional value creates conditions of the sharing economy concept in heritage practices and knowledge work. Sharing heritage can be defined as a socio-economic ecosystem built around the sharing of heritage information in the broader sense (raw data, structured information, knowledge and experience, interpretations

etc.), and includes the shared creation, production, distribution, use and reuse of information and services. Sharing heritage could be described by some features, based on the concepts of open world,<sup>46</sup> open access<sup>47</sup> and open source.<sup>48</sup> Therefore in the context of “from Uber to Google Books”, digital heritage professionals could be defined metaphorically as the personification of (informational) freedom (liberators), who light the ways to open access and a public domain future.<sup>49</sup>

However, in order for sharing heritage to function, not only the recognition of certain ideological concepts but also the appropriate digital infrastructures are necessary, based on the understanding between suppliers and customers which are characteristic for sharing economy. When analyzing the dual digital infrastructures which function at present, we can notice two basic types (actually, two disconnected worlds in digital infrastructures of heritage), which are based on different conceptual approaches. Most digital infrastructures created by memory and scientific institutions are based on an authoritarian (“top-down”) curatorial approach, according to which the creator of the infrastructure is an expert who knows the public’s needs and creates the product meant for them. Therefore, here suppliers and customers are in strongly fixed positions, where system creators are active suppliers and members of the general public are passive consumers. Such “official” digital heritage platforms (e.g., Europeana) are strongly structured (relational databases, controlled vocabularies, standardized metadata models, etc.), non-open source and, usually, without the possibility of sharing and co-creation. It is worth noting that, in the case of these infrastructures, digital technologies are applied instrumentally (only as “one more machine”), without taking into consideration the properties of these technologies as media or the changed needs of society. This may be one of the answers to the question of why the content of

46 *CIDOC-CRM*, XII.

47 *Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities*. München: Max-Planck-Gesellschaft, 2003, <https://openaccess.mpg.de/Berlin-Declaration>.

48 *Open source Philosophy*. Canonical Ltd., 2017, <https://www.ubuntu.com/about/about-ubuntu/our-philosophy>.

49 Cf. Benkler, Yochai. *The Wealth of Networks: how social production transforms markets and freedom*. Yale: Yale University Pres, 2007.

such digital heritage systems is so little used,<sup>50</sup> and quite a few projects are unsuccessful<sup>51</sup> and turning into “black holes”.<sup>52</sup>

“Sharing economy” models need to use a democratic (“bottom-up”), open, participatory, crowdsourced, “non-structured data” technology platforms, often accessed via mobile phone, to connect suppliers with consumers. The meaning of “supplier” and “consumer” there is flexible and changeable there depending on the situation (really each supplier could be a customer and vice versa). In this case, the process itself of relating between the person and the information infrastructure is different. If in the first kind of (curatorial) systems, our information receiving process can be defined as a “searching” (we are passive users), so in the case of “sharing infrastructures” it is a “discovery” (we are active, participatory researchers). So, in “sharing infrastructures”, everyone can be both passive consumer and active supplier and each can experience “the joy of discovery.” The functioning of consumers and suppliers model on the basis of sharing heritage is well illustrated by the #NewPalmyra project.<sup>53</sup> Studies show that most people who are not heritage professionals “migrate” to such “parallel [nonprofessionally-created] digital infrastructures”, based on social networks, Wikipedia, You Tube tools or (mostly in the case of business), crowdsourcing platforms (e.g., CloudCrowd, CrowdFlower, Choosa, Samasource, etc.).<sup>54</sup> And these “sharing tools” dominate even in such conservative areas as education, where in 2016 the top five in the UK were such sharing tools as You Tube, Google Drive and Twitter, and more curatorial positions representing Moodle remained in 11th place.<sup>55</sup>

Such “sharing tools”, market development and their popularity, and in the case of heritage practices and knowledge work, in part, question the need for the first type (structured, based on curatorial approach) infor-

50 *Europeana 2012–2013: usage and performance update*. CIBER Research Ltd, 2013, [http://ciber-research.eu/download/20130623-Europeana\\_2013\\_usage\\_and\\_performance\\_update.pdf](http://ciber-research.eu/download/20130623-Europeana_2013_usage_and_performance_update.pdf); For current statistics see: *Europeana statistics dashboard*. European Foundation, 2017, <http://statistics.europeana.eu>.

51 *CHAOS Report 2016*. The Standish Group International, Inc., 2017, <http://www.standishgroup.com/outline>.

52 Palm, “The Digital Black Hole”.

53 #NewPalmyra project, <http://www.newpalmyra.org>.

54 Dariusz T. Dziuba. “Crowdsourcing a migracja rynków pracy do cyberprzestrzeni”. In *Wirtualizacja. Problemy, wyzwania, skutki*, edited by L. Zacher, 235-256. Warszawa: Poltext, 2013.

55 Jane Hart. *Top 100 Tools for Education*. C4LPT, 2017, <http://c4lpt.co.uk/top100tools/top100-edu>.

mation systems in general (at least in terms of the development of new systems). The implementation of a cloud computing<sup>56</sup> approach and analysis of existing “sharing tools” would allow them to be used effectively in heritage practices and knowledge work without creating new systems, but more investment in content and semantic searching would be necessary, while paying less attention to the preservation of data and metadata infrastructures (such as “fair presentation”), and focusing more on search tools (how “to find more qualitatively”) for digital and digitized heritage data, information and knowledge (e.g. big data<sup>57</sup> and small data concepts<sup>58</sup>). On the other hand, the concept, based on the “good working browsing tool”, requires personal skills (creative information, digital and media literacy), because in this case, the browsing is less technical action and more discovery. In searching we are passive users and in discovery we are active “researchers”. Search success depends upon information professionals (curators) and in discovery we have the participatory approach (compared with our earlier discussions about “two worlds” of digital heritage: the “curatorial world” and the “shared world”).

### *2<sup>nd</sup> Conflict: From People to Robots*

If we tried to create a dictionary of digital culture definitions, one of the most important would be “algorithm”. This concept is important in describing the differences between the reality that obeys strict rules and the reality that is free, creative and where the rules are hard to apply. The development of digital technology shows that algorithmic reality will soon be completely controlled by robots.<sup>59</sup> According to Kelly, we can distin-

- 56 Kristine Hoff Meyer, Mikkel Christoffersen, Henk Alkemade, Maria Luisa Martinez-Conde, Rimvydas Laužikas, Ingrida Vosyliūtė, Martin Krajinak, Tatiana Shamarina-Heidenreich. *Report on the State-of-the Art Monitoring and Situation Analysis*. LoCloud project Deliverable 1.1., 2013, [http://pro.europeana.eu/files/Europeana\\_Professional/Projects/Project\\_list/LoCloud/Deliverables/d1.1-state-of-the-art-monitoring-ver1.pdf](http://pro.europeana.eu/files/Europeana_Professional/Projects/Project_list/LoCloud/Deliverables/d1.1-state-of-the-art-monitoring-ver1.pdf).
- 57 Viktor Mayer-Schönberger and Kenneth Cukier. *Big Data: A Revolution that Will Transform how We Live, Work, and Think*. Boston: Houghton Mifflin Harcourt, 2013.
- 58 Martin Lindstrom. *Small Data: The Tiny Clues That Uncover Huge Trends*. New York, St. Martin's Press, 2016.
- 59 Martin Ford. *Rise of the Robots: Technology and the Threat of a Jobless Future*. New York: Basic Books, 2016.

guish several robotic “influence” spaces: “jobs humans can do, but robots can do even better”, “jobs humans can’t do, but robots can” and “jobs we didn’t know we wanted done”.<sup>60</sup> Obviously, in the space of algorithmic reality people are already not comparable to machines. The “turning point” was in the now quite distant past, in 1997, when a chess grandmaster Garry Kasparov lost to the computer “Deep Blue”.<sup>61</sup> Another currently rising algorithmic reality phenomenon is so-called “biohacking”,<sup>62</sup> which basically directly realized Marshall McLuhan’s idea of viewing technology as extensions of the human body.<sup>63</sup> Conflicts caused by man-machine interaction today are not so clearly visible in the public space as a “sharing economy” (the place where the community of artificial intelligence critics is quite active<sup>64</sup>). However, the research draws very clear contours concerning future social conflicts based on the transfer of algorithmic activities to robots. Due to the spread of robotization there is a big probability that in the coming decades, robots will not only hold the majority of jobs, but will also eliminate many professions<sup>65</sup> and significantly reduce the need for non-creative employees. The example of such an automated future structure could be tested by the automatic Amazon store,<sup>66</sup> or automatic cars,<sup>67</sup> eliminating seller’s and driver’s professions. Already, in the European Union, there is a gap between the number of the unemployed and vacancies,<sup>68</sup> which means that some of the unemployed because of their qualifications cannot fill existing vacancies and are doomed to long-

60 Kelly, *The Inevitable*.

61 Bruce Pandolfini. *Kasparov and Deep Blue: The Historic Chess Match Between Man and Machine*. St. Palsmer: Fireside Books, 1997.

62 Ben Popper. “Cyborg America: inside the strange new world of basement body hackers”. *The Verge Magazin*, August 8, 2012, <http://www.theverge.com/2012/8/8/3177438/cyborg-america-biohackers-grinders-body-hackers>.

63 Marshall McLuhan. *Understanding Media: The Extensions of Man*. New York: McGraw Hill, 1964.

64 Rory Cellan-Jones. “Stephen Hawking warns artificial intelligence could end mankind”. *BBC News*, December 2, 2014, <http://www.bbc.com/news/technology-30290540>.

65 Carl Benedikt Frey and Michael A. Osborne. *The future of employment: how susceptible are jobs to computerisation?* Oxford: University of Oxford, 2013, [http://www.oxfordmartin.ox.ac.uk/downloads/academic/The\\_Future\\_of\\_Employment.pdf](http://www.oxfordmartin.ox.ac.uk/downloads/academic/The_Future_of_Employment.pdf).

66 Rupert Neate. “Amazon Go store lets shoppers pick up goods and walk out”. *The Guardian*, December 5, 2016, <https://www.theguardian.com/business/2016/dec/05/amazon-go-store-seattle-checkouts-account>.

67 Waymo. Alphabet Inc., 2017, <https://waymo.com>.

68 *Unemployment statistics*. Eurostat, 2017, [http://ec.europa.eu/eurostat/statistics-explained/index.php/Unemployment\\_statistics](http://ec.europa.eu/eurostat/statistics-explained/index.php/Unemployment_statistics).

term unemployment. Richard Florida’s creative class research shows that even in the most creative cities of the USA, the so-called “creative class” (people whose jobs will most likely not be taken by robots) consists of 74.2 to 76.9 percent of the population.<sup>69</sup> Therefore, while pessimistic scenarios concerning the outsourcing of algorithmic jobs to robots are coming true, in the coming decades we can expect a society where long-term unemployment will reach 30-40 percent, where the most important social exclusion feature can be personal creativity, and about 10 per cent of available creative jobs can remain vacant. In wider contexts, this gap prompted by digital effects may be the cause of significant political change. We can raise and research the hypothesis about correlation between the creative class distribution in the United States and the 2016 presidential elections results, where Trump received votes from the states with a relatively smaller percentage of creative class persons with good salaries.<sup>70</sup> Meanwhile, we can capture the trends of future societies based on student achievement results of the Programme for International Student Assessment (PISA),<sup>71</sup> hypothetically arguing that countries that occupy a higher position on the PISA studies will deal more easily with any future problems relating to creativity/no-creativity gap challenges. However, this statement means that even now we have to look at all the different levels of the educational system. After all, pre-school children today will find themselves in the labor market essentially after only 15-20 years (in 2031-2036), at a time when (according to scientific studies) robots will begin intensively to occupy the algorithmic jobs. Therefore, the education system must be re-oriented from the view that knowledge is a goal in educational process towards the view that it is only a means to higher-level competencies such

69 Richard Florida. *America’s Leading Creative Class Cities in 2015*. CityLab, Apr 20, 2015, <http://www.citylab.com/work/2015/04/americas-leading-creative-class-cities-in-2015/390852>.

70 Comparison between: Richard Florida. *The Geography of high-paying jobs*. Creative Class, August 5, 2010, [http://www.creativeclass.com/\\_v3/creative\\_class/2010/08/05/the-geography-of-high-paying-jobs](http://www.creativeclass.com/_v3/creative_class/2010/08/05/the-geography-of-high-paying-jobs); Richard Florida. *Who’s Your City?* Creative Class, August 5, 2005, [http://www.creativeclass.com/\\_v3/whos\\_your\\_city/maps/#The\\_Creative\\_Class\\_Map](http://www.creativeclass.com/_v3/whos_your_city/maps/#The_Creative_Class_Map), and “2016 electoral map”. *CNN Politics*, November 9, 2016, <https://edition.cnn.com/2016/11/04/politics/road-to-270-electoral-college-map-november-4-duplicate/index.html>; Jason Brennan. *Against Democracy*. Princeton: Princeton University Press, 2016.

71 OECD PISA (*The Programme for International Student Assessment*). OECD, 2017, <http://www.oecd.org/pisa/aboutpisa>.

as creativity, critical thinking, digital and informational literacy, attitude and ability for life-long learning.<sup>72</sup> Algorithmized activities are likely to change not only educational philosophy, but also educational content. If we talk about a person's education in the digital culture, we can guess that one of the greatest innovations will be a spread of massive audio-text generators. There is already quite a lot of software that converts language to text and vice versa – converting text to sound. So far, this is not a mass technology. However, in the next decade it will become massive. This will mean that eventually the ability to read and write will become basically useless. Therefore, there will be a need to consider their expediency in school programs. On the other hand, the development of this technology is related with high-quality automated translation, which will allow us not only to “speak” in any language, but also to “read” texts in any language. Therefore, the skills of writing, reading and foreign language will likely become an elite (maybe as well socially exclusionary) competence of those who want to (for example) actually read fiction in its original language.

These discussed conflicts allow us to draw a vector indicating the growth of robot- or cyborg- (biohacked humans) performed jobs<sup>73</sup> and of the role of human creativity, which function in broad social, political, economic and other contexts. In heritage practices and knowledge work, this means the growth of the role of automatically generated digital information and knowledge in heritage research, conservation and communication processes. It also means the growth of institutional and individual reactions whose extremes can be defined as automated technology pessimism (the “new luddites” movement, the anti-automation view<sup>74</sup>) or technological optimism, based on the understanding that when robots perform algorithmic activities more time is left to realize personal creativity. Thus, in the context of “from people to robots”, the digital heritage professional metaphorically could be defined as a Jedi Knight, who rules the creative “army” of drones, droids, clones and cyborgs.

72 *National Core Curriculum*. Finnish National Board of Education, 2014, [http://www.oph.fi/english/curricula\\_and\\_qualifications/basic\\_education/curricula\\_2014](http://www.oph.fi/english/curricula_and_qualifications/basic_education/curricula_2014).

73 Tom Boellstorff. *Coming of Age in Second Life: An Anthropologist Explores the Virtually Human*. Princeton: Princeton University Press, 2015.

74 Ford, *Rise of the Robots*.

The examples of such activities in heritage practices and knowledge work can be the automated search and identification<sup>75</sup> of heritage objects or heritage monitoring<sup>76</sup> through the use of semi-automatic computer devices using 3D image capture and analysis technology. Identification, investigation and preservation of cultural heritage are among the main challenges for contemporary society. They are closely connected with several dimensions: technology transfer, scientific investigations, global-local rhetoric, cultural tourism, armed conflicts, immigration, cultural changes, investment flows, new transport infrastructures, etc. Nowadays organizations responsible for heritage investigation and management constantly have to deal with a lack of resources that are crucial for proper heritage identification, investigation and preservation, maintenance and protection. It is particularly problematic for countries with low GDP or unstable political situations. The possible solution of these problems could be information management-based methodology, connected with automated and semi-automated heritage investigation and a monitoring software system, based on the 3D technologies, where 3D scanning technology is used as the most accurate method to find heritage objects in the natural landscape and can capture the situation of an evolving cultural heritage object or complex at a given time. As a cultural heritage object or complex is evolving continuously, two 3D point clouds created at different times allow reliable tracing of potential changes. Monitoring of large-scale heritage complexes such as urban heritage objects is a resource-demanding task and in such cases semi-automatic computer-based 3D visual analysis is appropriate. Comparison of 3D visual data captured at different times advances to next level when utilizing methods of 3D photogrammetry that make it possible (at least partially) to create 3D point clouds from old photos, giving us opportunities to expand research by adding empirical

75 Melanie A. Riley. Automated Detection of Prehistoric Conical Burial Mounds From Lidar Bare-Earth Digital Elevation Models. Northwest Missouri State University, 2009, <http://www.nwmissouri.edu/library/theses/2009/RileyMelanie.pdf>; Øivind Due Trier and Maciel Zortea. "Semi-automatic detection of cultural heritage in lidar data". *Proceedings of the 4th GEOBIA*, May 7–9, 2012, <http://mtc-m18.sid.inpe.br/col/sid.inpe.br/mtc-m18/2012/05.17.16.52/doc/039.pdf>.

76 Rimvydas Laužikas, Albinas Kuncevičius, Tadas Žižiūnas, Egidijus Žilinskas. "Automated heritage monitoring software prototype implementing 3D technologies". *The 44th Computer Applications and Quantitative Methods in Archaeology*. Conference (CAA 2016). Oslo, March 29, 2016 – April 2, 2016; Kuncevičius et al., *Dubingių mikroregionas*.

data captured before 3D scanning equipment and also lowering the costs of conducting such research.

### *3<sup>rd</sup> conflict: from the national state to the ideological community*

The research captures the two ongoing opposite, but also related phenomena: convergence and new fragmentation. At the global level during ongoing convergence processes, society becomes similar (similar cultural events, social behavior patterns, dependence on global brands, etc. become firmly established) and the old limitations typical for an industrial society start to disappear. This process is widely discussed in the public domain and in various (economic, political ideas, cultural, etc.) discourses. However, even Manuel Castells observed that there is growing importance of identity in modern society as a counterweight to the uncertainty of the global world. According to Castells, building materials for the construction of identity are provided by history, geography, biology, production and reproduction institutions, collective memory, personal fantasies, power apparatus, and religious revelations.<sup>77</sup> Therefore, at the same time as globalization, fragmentation processes are happening that are much less visible in the public space. This new fragmentation is associated with the emergence of new limits of the networking society. During the process, on a local level are creating and strengthening groups with specific local (historical, geographical, thematic, religious, cultural, etc.) identities. These groups are systematically maximally solid inside and distinctly separate from the other groups. The processes which happen inside the groups are similar to those which were captured in industrial society in religious communities. Among them, the most important is the unconditional belief in some basic idea and a negative attitude towards the people who doubt this idea (heretics). In this way, the group (as a like-minded community) falls into a kind of “ideological and informational bubble” when people belonging to it are faithful to a particular idea and do not criticize or discuss this idea in principle. Therefore, members of the com-

77 Castells, *The Information Age*.

munity do not see the broader context and somehow distance themselves from society. Some communities actively become more radical (moving away from the global society “average”), actually increasing social dispersion. Although it is generally stated that the present society is becoming more global, actually we are witnessing the global convergence and local polarization process, which leads to identity-based society clustering. In different areas of reality, it is manifested in different ways. In politics, we see the similarity of programs based on traditional ideologies (liberalism, conservatism, social democracy) and the emergence of new “clear identity” parties (such as Syriza in Greece or the “Pirate Party” in Iceland), which are independent from the “old” ideology parties. In science there is a spread of inter- and meta- disciplinarity, when the researchers of different “old” fields of science, focus on scientific problems bound communities. Does this mean that the future of research directions will be, for example, “immigrantology” which investigates the problems of migration or “exitology” which investigates the relations of member states and the European Union (c.f., Brexit)? In social networks, which are essentially a global phenomenon, there are a growing number of groups that are very closed and brought together around one particular idea (“digital tribes”).<sup>78</sup> In the political map of the world marked by mass migration, the formal “old” borders of countries are increasingly disappearing and their places are taken by communities brought together around particular ideas, and their members, regardless of their place of residence may be loyal, for example, to the idea of citizenship. In some cases, these communities of “loyal extraterritorial citizens” help their country to achieve higher places in the Eurovision Song Contest. In other cases, they can become the foundations of expansive derivatives, such as the new “Russian world”<sup>79</sup> or ISIS.<sup>80</sup> Estonia has even realized a separate digital citizenship concept

78 Chris Mears. “Digital Tribes – Creating Behaviour Change in Users”. *theUXreview*, October 29, 2013, <http://theuxreview.co.uk/digital-tribes-creating-behaviour-change-users>.

79 Luke Harding and Shaun Walker. “Closure of Russia Today bank accounts nothing to do with us – Treasury”. *The Guardian*, October 17, 2016, <https://www.theguardian.com/world/2016/oct/17/russia-todays-uk-bank-accounts-frozen-says-editor>.

80 Pieter Van Ostaeyen. “Why have IS jihadists targeted Belgium?”. *BBC News*, March 25, 2016, <http://www.bbc.com/news/world-europe-35882372>.

and a separate digital conscript military service.<sup>81</sup> In this way, the state becomes the authority-controlled community that is related with many other communities, identities and ideological structures, and functions in a blended way in virtual and real spaces. Next in the line of future “new type” states are global corporations’ states (whose “citizens” are loyal to the brand).<sup>82</sup> The financial capacity and influence on communities of such corporations as Coca-Cola, Microsoft, or Apple are significantly ahead of some of the “traditional” states, and the safety agency G4S “army”, by its numerousness features twentieth among the world’s largest armies.

Such growth of identity value in heritage practices and knowledge work means growth in the influence and responsibility of digital heritage professionals (they generate ideas that can be destructive). On the other hand, in this context of digital culture, the heritage is contemporized. It functions not so much as knowledge of the past, but more like the tangible or intangible<sup>83</sup> element of present culture (heritage as design<sup>84</sup>). Modern people’s interests, rather than past ideas or matter, come into heritage centered practices and knowledge work and the heritage itself becomes a resource of modern society.<sup>85</sup> Thus the line is being erased between heritage (which belongs to the past and represents past culture) and contemporary culture. The heritage essentially becomes a present – like a tool of modern culture, modern entertainment industry, identity construction, political communication, and so forth, acting not so much as a place (c.f., genius loci, lieux de mémoire), but more like the “displaced” idea of communities of people who were displaced with the help of digital technologies from their usual geographical space and linked to the solid space of the “global village” world (c.f., CIDOC -CRM, E28 Conceptual Object “...

81 Anthony Cuthbertson. “Estonia First Country to Offer E-Residency Digital Citizenship”. *International Business Times*, October 7, 2014, <http://www.ibtimes.co.uk/estonia-first-country-offer-e-residency-digital-citizenship-1468766>.

82 Martin Lindstrom. *Brand Sense: Sensory Secrets Behind the Stuff We Buy*. New York: Free Press, 2010.

83 Laurajane Smith. *All Heritage is Intangible: Critical Heritage Studies and Museums*. Amsterdam: Reinwardt Academie, Amsterdamse Hogeschool voor de Kunsten, 2011.

84 Michael Shanks. *Let me tell you about Hadrian’s Wall: heritage, performance, design*. Amsterdam: Reinwardt Academie, Amsterdamse Hogeschool voor de Kunsten, 2012.

85 Gregory J. Ashworth. “From history to heritage: from heritage to identity: in search of concepts and models”. In *Building a New Heritage: Tourism, Culture and Identity in the New Europe*, edited by Ashworth, G.J., Larkham, P.J., 13-30. London: Routledge, 1994.

non-material products of our minds and other human produced data that have become objects of a discourse about their identity, circumstances of creation or historical implication...<sup>86</sup>). Therefore, in the context of “from the national state to the ideological community”, the digital heritage professional metaphorically could be defined as a Prophet with high level or responsibility, because only a thin red line separates a constructive interest in the heritage and a destructive nationalism (or another heritage-based identity akin to some kind of “new religious fanaticism”).

#### *4<sup>th</sup> Conflict: From the Linear Text to the Set of Linked Images*

The culture and worldview of industrial society is closely related with the textual culture of the printed book and a linear and fragmented relationship with reality that it has instilled (the book is read in a linear way, seeing only a particular part of it at one time – a fragment of the book). The linearity of reality can be traced in a lot of industrial society’s products, beginning with the industrial belt and ending with museum exhibits (constructed linearly on the principle – “from ancient times to the present day”). Also, it can be traced in linear or linear-cyclic models based on the time arrow,<sup>87</sup> which visualize various processes of reality (for example, information behavior, and the information life cycle). The idea (very popular in industrial society) of societal, technological, ideological and so forth progress is also based on these models. However, during the formation of the network society, cultural textuality and linearity are questioned. Therefore, one of the most active discussions of today is related to the perspectives of the printed book and book reading in digital culture, the relation between textual culture and visuality and cultural network development. Studies captured clear trends of the spread of visual culture in social networking, encouraging networking developers to invest in strengthening the technical possibilities of visual content sharing.<sup>88</sup> However, in the public discourse people increasingly become aware that visual-

86 CIDOC-CRM, 16.

87 Prigogine and Stengers, *The End of Certainty*.

88 Fidji Simo. “The Latest on Facebook Video”. *Facebook Newsroom*, September 7, 2014, <http://newsroom.fb.com/news/2014/09/the-latest-on-facebook-video/>.

ity is more a natural status directly associated with the relationship between a person and reality rather than a perception of reality through the intermediation of text. The functioning of text in digital culture evolves in several directions. First of all, text loses its dominant information function and turns into an extension of reality, a sort of augmented reality product, which (along with other media) acts as one of the equivalent communication reality elements augmenting our personal relationship with the reality-based experiences of other people's relationship with reality. The modern website, in terms of communications (as information broadcasting) and user's information behavior, is closer to the medieval cathedral than to a book, because both the cathedral and the website have predominantly visual elements that are presented in a holistic way (the user sees the whole and not the fragment) whereas the "reading" process is not linear (such as in books) but networked. In this context, the printed book takes its niche among other media. Here the situation is somewhat similar to that of wildlife. In the 19th century, Charles Darwin described the variability and heritability phenomena that guarantee a huge animal and plant species diversity, because in the long run, every species has its special place (niche) and therefore does not compete with other species and remains. Species that do not survive the competition disappear. A similar process is at work with the survival of media in culture. New media<sup>89</sup> are looking for their own niches or to take over those of old media. The printed book did not destroy manuscript culture, cinema did not destroy theatre and TV did not destroy cinema. All of them have found their own unique niches. However, mobile telephony destroyed the telegraph, and electronic mail destroyed the facsimile (fax). Therefore, in case of the book, in some segments (for example, informational – encyclopaedias, dictionaries, reference books, etc.) printed books will be excluded, but in the other spheres (fiction), they are likely to remain. The second important element in the evolution of the text is the change to textuality elite, (which has already been mentioned in the section on robots). Such a textuality elite (reading and writing) was formed in medieval European society, where there was

89 Lev Manovich. *The Language of New Media*. Cambridge, Mass.: MIT Press, 2001.

only a minority of books and educated people who were able to enjoy the “direct” fruits of revelation-written Gospels. Therefore, art was positioned as a lower-level “Gospel for the illiterate”.<sup>90</sup> This approach has been an important provision, shaping industrial society and encouraging governments to introduce compulsory primary education, and thus reading and writing abilities become less elite by being democratically “shared” with all members of society. However, digital technology allows for automatic reading, writing and text translation possibilities which, (in the long-term) can turn the personal reading, writing and language skills that may again become elite. In this context, the automatic creation of texts poses an interesting question. The idea of automatic text generation is not new, but its implementation was previously limited by relatively small computer abilities. Automatically-generated text has become a reality only in modern times. It can be implemented as kinds of artistic-technological projects<sup>91</sup> or as automatically generated fiction. There is no doubt that through the algorithmic method we cannot create such quality works as Tolkien, Tolstoy, Eliot and Proust created, but the creation of many modern popular novels we really can entrust to computers. The third text evolutionary direction can be defined as the so-called “new textuality”. Texts written in letters and digital technology are directly related in the mutual connection. It should be noted that digital technology was created by a civilization that uses the phonetic writing (letters), instead of hieroglyphics. For the creation of binary coding-based technology the specific requirements, abstract personal symbolic thinking patterns were necessary, which were formed by using phonetic writing, Arabic numerals and Western music notation. These three abstract symbol categories (letters, numbers and notes), in terms of digital culture formation, are important as tools that allowed the dissection of continuous reality, by splitting sequences not into the objects (as is done in case of hieroglyphic writing), but into smaller, abstract “sub-objected” elements which are more versatile than the objects, and which are suitable to effectively “describe” any reality (tangible and intangible). It is interesting to note that modern research highlights

90 Jacques le Goff. *Medieval civilisation*. Hoboken: John Wiley & Sons, 1991.

91 *Artūrka - dirbtinis idiotas*, <http://www.ranksays.com/arturka.lt>.

this different type of innovation specifics<sup>92</sup> of civilizations that use phonetic writing and hieroglyphic writing. Thus, we can analyze the relation between society and text writing as an evolutionary process that began as a realistic and technologically unsophisticated reality recording (pictograms, hieroglyphs) and is evolving towards abstraction, universality and technological sophistication. In this process of evolution, we can distinguish at least four texts levels: manuscript no-phonetic, manuscript phonetic, printed phonetic and program code. It is specifically the software code that could one day change the highly abstract, universal and technologically sophisticated text (it became possible as never before to effectively display the medium of multimedia information). It should be noted that for the mastering of plain text (writing, reading skills) it is usually sufficient to have a primary-level education, while computer programming requires the university-level study program. However, we can say that programmers are the real “writers” of these days. And finally, the text’s “liquidity”,<sup>93</sup> is associated with its incompleteness, sharing and openness.<sup>94</sup> These are created by using network tools (social networks, blogs, wiki) that realize multi-media, interactivity (the possibility to interact with the work as a reader, and as a writer), multi-authorship (crowdsourcing), the possibility to develop a number of different and independent plotlines (“open source principle”), the use of hypertext while “traveling” in a story (not required [but not prohibited] linear reading), and the possibilities virtually to visit the described places, to get more information and experience.<sup>95</sup> We can note that the present digital texts become closer to the public folklore of the pre-industrial period than to the literature of the industrial period, when a limited number of plots/works are realized in an unlimited number of works.<sup>96</sup>

On the other hand, the text change in digital culture and the spread of

92 Richard Florida. *The World is Spiky*, <https://www.theatlantic.com/past/docs/images/issues/200510/world-is-spiky.pdf>.

93 Cf. Zygmunt Bauman. *Liquid modernity*. Cambridge: Polity Press, 2000.

94 Umberto Eco. *The Open Work*. Cambridge MA: Harvard University Press, 1989.

95 Hartmut Koenitz, Gabriele Ferri, Mads Haahr, Diğdem Sezen, Tonguç İbrahim Sezen. *Interactive Digital Narrative: History, Theory and Practice*. New York: Routledge, 2015.; Koskimaa, *Digital Literature*.

96 C.f., Hans-Jörg Uther. *The Types of International Folktales: A Classification and Bibliography. Based on the system of Antti Aarne and Stith Thompson* (Three volumes). Helsinki: Suomalainen Tiedeakatemia, 2010-2011.

network technologies and network society destroys another of our thinking constructs – “linearity thinking”, which is formed of Judeo-Christian world-view (time linearity) and printed book culture (reading linearity). On the basis of this construct, we created many framing models of scientific knowledge, starting with the development models of early Christian history and ending with Darwin’s natural evolution or with Marx’s evolution of society. The linear construction of reality has become the basic component of industrial society research and education that constituted the construction of theoretical models and the research design and interpretation of fixed trends. However, some signs suggest certain limitations of “linear science” in modern society studies (we see this in the investigations of so-called “Generation Z”, which captures exceptionally negative traits of this generation or public opinion surveys in quite a number of countries (especially when election results are predicted) “go awry”).<sup>97</sup> Hypothetically we can state that the “linear science” models applied to the industrial society of a linear nature do not allow us to achieve effective results when the networking society is tested, and these changes, together with other changes, form the phenomenon called “The Third Science Revolution”, which influences activities in the heritage sector.<sup>98</sup> The change of textuality and linearity in the digital culture allows one to capture the decline in importance of text-based linear and cyclical-linear models and the growth the importance of object-oriented networked models.

Moving this vector to heritage practices and knowledge work, we can talk about textuality and text-based communication and also about the change of science linear models and linear-based paradigms. The digital heritage professional (“from linear text to networked set of images” in the context of the vector) becomes similar to the medieval craftsman and is an art (like when it is meant for “Gospel illiterates”) creator, who operates more on objects (things) than on texts. In heritage practices and

97 Julianne Micoleta. “Generation Z Teens Stereotyped As ‘Lazy And Unaware’”. *The Huntington Post*, June 03, 2012, [http://www.huffingtonpost.com/2012/03/06/apathetic-teens-generatio\\_n\\_1323577.html](http://www.huffingtonpost.com/2012/03/06/apathetic-teens-generatio_n_1323577.html).

98 Kristian Kristiansen. “Towards a new paradigm? The Third Science Revolution and its Possible Consequences in Archaeology”. *Current Swedish Archaeology*, 22 (2014), [http://www.arkeologiskasamfundet.se/csa/Dokument/Volumes/csa\\_vol\\_22\\_2014/csa\\_vol\\_22\\_2014\\_s11-34\\_kristiansen.pdf](http://www.arkeologiskasamfundet.se/csa/Dokument/Volumes/csa_vol_22_2014/csa_vol_22_2014_s11-34_kristiansen.pdf).

knowledge work this means the movement from “text oriented” to “object oriented” models. The transcoding of reality from an analogue to a digital system, performed during the digitization of heritage, is connected with two methodological models: the “text oriented” model and the “object oriented” model. The “text oriented” model was created mostly by librarians (“text oriented community”) at the early stage of the computerization of cultural heritage. It is based on a “hierarchical thinking” paradigm and usually describes the world via hierarchically organized controlled vocabularies and other structured texts (such as relational database attributes, tables and relationships). Despite the evident significance of the “text oriented” model for the development of the digitization of cultural heritage, it is also necessary to note the essential limitations of this model. The actual world (reality) is continuous and is composed of interconnected objects (not concepts) that are organized according to a non-hierarchical structure. In a broader sense the cultural heritage information universe consists of “physical things” and “symbolic objects” (in meanings of CIDOC-CRM),<sup>99</sup> whereas the physical things are “empirically real” and symbolic objects are created by our minds. From the point of view of digital technologies, they are both information (binary code), but “text oriented” models ignore the physical things. Specifically they (physical things) are transformed into symbolic objects (concepts, appellations and so forth) by “text oriented” professionals, because they have higher level of skills and competencies to work with texts, but not with physical objects. The “object oriented” model proposes a different point of view. This model was created during the modern stage of the computerization of cultural heritage mostly by museologists (“object / artefact oriented community”) and is connected with the growth in computer possibilities in the last decades. It is based on a “network” paradigm and usually describes the world via a network-organized object’s ontology. The ontological “object oriented” model is more connected with reality, because, the physical things (e.g., real place or time) and symbolic things (e.g., place-time appellations) are described as separate classes of reality. Symbolic interconnections between

99 CIDOC-CRM, 12, 40.

text oriented” and the “object oriented” models could be explained as one of the conceptual differences between UNIMARC<sup>100</sup> and CIDOC-CRM.<sup>101</sup> On the one hand, CIDOC-CRM works as object-oriented ontology, but on the other, CIDOC-CRM proposes an absolutely different concept of reality, where reality is composed not from stable things (objects), but from dynamic events. A CIDOC-CRM event acts as a kind of space-networked node, linking the various objects of reality – physical and symbolic things, persons, places, time, their appellations etc. It is also important that the CIDOC-CRM model is not strictly hierarchical, allowing multiple inheritance (“a class a may have more than one immediate superclass”).<sup>102</sup>

On the other hand, we can talk about the change in the models (which are applied in research) towards networking. Most of the current information management, information life-cycle, information behavior, etc. models (e.g., Wilson, Shannon, Choo), created in the industrial society are linear or, in some cases, cyclically-linear, whereas after the last stage model starts from the first stage. But, the question “how many linear models work in digital space and in network society” is important for contemporary scholarship. We can guess that to study modern society we will have to create modified, less linear and more networked models, whereas it is possible to “directly jump” (interactive, hypertextually) from each stage of a linear model to any other stage and to return again.

## Discussion

In this discussion article we discussed several transformations in heritage practices and knowledge work that are the effects of digital capabilities. There are many more such trends and challenges caused by them. By observing them we can draw the development contours of both public and heritage practices and knowledge work. Here we can discuss several scenarios. The first is to resist the changes. The historical experience con-

100 UNIMARC *Strategic Programme*, <https://www.ifla.org/unimarc>.

101 CIDOC-CRM.

102 CIDOC-CRM, XI.

cerning the acceptance of the car, television, railway and many other technologies, shows that this scenario is pointless (c.f., Kelly, *The Inevitable*).<sup>103</sup> In the case of digital technologies, the most active here is the so-called Generation X – people who were born, grew up and gained education and worked long enough without digital technology. For part of them this technology seems confusing, scary and dangerous. They hardly grasp either the opportunities or the threats of this technology, and, in most cases, they reject it. However, after 10-20 years there will not be much of the cultural, political or economic power of this generation at the “top” of the society, and growing Generations Y or Z will definitely eliminate the “man with a flag” type regulations (created by Generation X) that were meant to “soften” the digital effects-based transformations. The other two scenarios can be called “optimistic” and “pessimistic”. In the optimistic scenario, the formation of the network society is perceived as a universal possibility, unlocking the creative powers of the majority of people, which, based on robotic algorithmic powers, will allow a freer, more democratic, more open society. Maybe in this society we will not have the usual power structures such as parliaments, and the laws will be drafted and adopted by “crowdsourcing”. In a pessimistic scenario the impact on society of digital technology is perceived as a global threat, leading (to paraphrase George Orwell) to the new year of “2084”. It’s so easy, by means of digital technology and the superiority of public interest against the individual interests, to introduce totalitarianism in support of “public welfare”. So, in the context of heritage practices and knowledge work, we can ask ourselves: what is and what will be the roles of digital heritage professionals now and in future – liberator, Jedi knight, prophet or craftsman? Or, maybe, somebody who will wait for us in the open informational world, situated beyond our incomplete information “relative to the universe of discourse they intend to describe”.<sup>104</sup>

103 Kelly, *The Inevitable*.

104 CIDOC-CRM, XII.

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## PROMJENE PRAKSE POVEZANE S BAŠTINOM I UPRAVLJANJEM ZNANJEM TEMELJENE NA DIGITALNIM UČINCIMA

### KLJUČNE RIJEČI:

*kulturna baština, digitalna  
kultura, umreženo  
društvo, metafore*

### SAŽETAK

*Brzo širenje informatike donijelo je velike promjene u razvoju društva. Istraživanja u poslovnom sektoru omogućuju nam da raspravljamo o novim konceptualizacijama baštine, kao i o promjenama načina funkcioniranja baštine u društvu i praksama povezanim s baštinom i upravljanjem znanjem u cjelokupnom kontekstu digitalne kulture. U tom kontekstu, baština je osuvremenjena: funkcionira ne toliko kao znanje iz prošlosti, već više kao element sadašnje kulture. Tako je izbrisana linija između baštine (koja pripada prošlosti i predstavlja prošlu kulturu) i suvremene kulture. U članku se razmatraju elementi digitalne kulture važni za praksu povezanu s baštinom te upravljanje znanjem: tekstualnost i vizualnost, otvorenost i zatvorenost, tekstualni i objektno usmjereni pristupi, koncentracija i decentralizacija, stručnost i nabava iz mnoštva, statička priroda te interaktivnost, jednosmjerna komunikacija i sudjelovanje, gejmfikacija i tako dalje.*