

Decision Making under COVID-19. A Possible Way to Mitigate the Crisis Impact. A Multidisciplinary View from Romania

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The paper presents a multidisciplinary view related to the impact of the COVID-19 pandemic on the educational and cultural fields, with particular cases and scenarios from Romania. Some aspects regarding the use of video conferencing technologies in the educational system are described, highlighting that the choice of a particular solution depends on the cultural profile of the users. Virtual Exhibitions are presented as one of the ways to mitigate the impact of the crisis in the cultural field. The development and use of Virtual Reading Rooms and Virtual Teaching Spaces, proposed by Research Libraries UK, is another solution to mitigate the crisis impact in educational and cultural sectors.

Keywords: Decision Making, COVID-19 Pandemic, Virtual Exhibitions, Education, Culture.

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1 Introduction

According to [1], one of the most challenging aspects of building a healthier community is that success is defined by whatever doesn't happen, a characteristic that is impossible to quantify to some extent.

The COVID-19 pandemic has demonstrated the significance of all businesses being prepared to deal with significant, unplanned change. Organizations that can successfully absorb and adapt to the challenges of the COVID-19 pandemic are resilient. Many people are also making decisions at a rate that would have been unthinkable prior to the COVID-19 outbreak [2].

To promote agility, five criteria were discovered across all enterprises [2]:

- Create frameworks that allow for swift decision-making, including resource reallocation to match changing priorities;
- Build networks of local teams with clear roles and duties;
- Build a common objective and better communication;
- Foster a culture that empowers helps motivate individuals to pursue their entrepreneurial ambitions;
- Ensure that people have access to the technologies they require.

According to [3], several collection-holding organizations have been actively investigating

new and inventive ways to enable digital access to certain collections. The rise of the COVID-19 epidemic has increased this requirement. The closing of libraries, archives, and museums to researchers at the peak of the pandemic, as well as limited access during multiple periods of governmental lockdown and social distancing regulations, have severely hampered scholars' capacity to conduct research.

2. The Impact of the Pandemic to the Educational System

The educational system will undoubtedly experience considerable changes in the near future, both in terms of how courses are provided and how students in educational processes participate. Video conferencing platforms such as Zoom, Skype, Google Meet, Webex, Microsoft Teams, and a few others have been widely adopted not only for private purpose, but also as the primary solution available for the continuity of educational and business activities over the last two years [4]. When selecting a solution, consider not just the license costs, but also the functions supplied by each solution, how convenient it is to install and use it on both desktop and mobile devices, and other elements that have helped these platforms become so popular in

such a short amount of time. These characteristics differ greatly and must be thoroughly evaluated before being used in a severe situation.

The cultural identity of the participants is an important factor in differentiating the use of web platforms for virtual meetings and other collaborative purposes. An examination of current video conferencing solution usage by gender, age, country, and educational level of

participants would be very interesting. Individuals, organizations, communities, and countries all have various preferences when it comes to specific solutions.

Figure 1 depicts the statistics for Zoom attendance for 36 participants over a period of approximately 420 minutes for students enrolled in a master's degree program whose activities are taking place over the weekend.

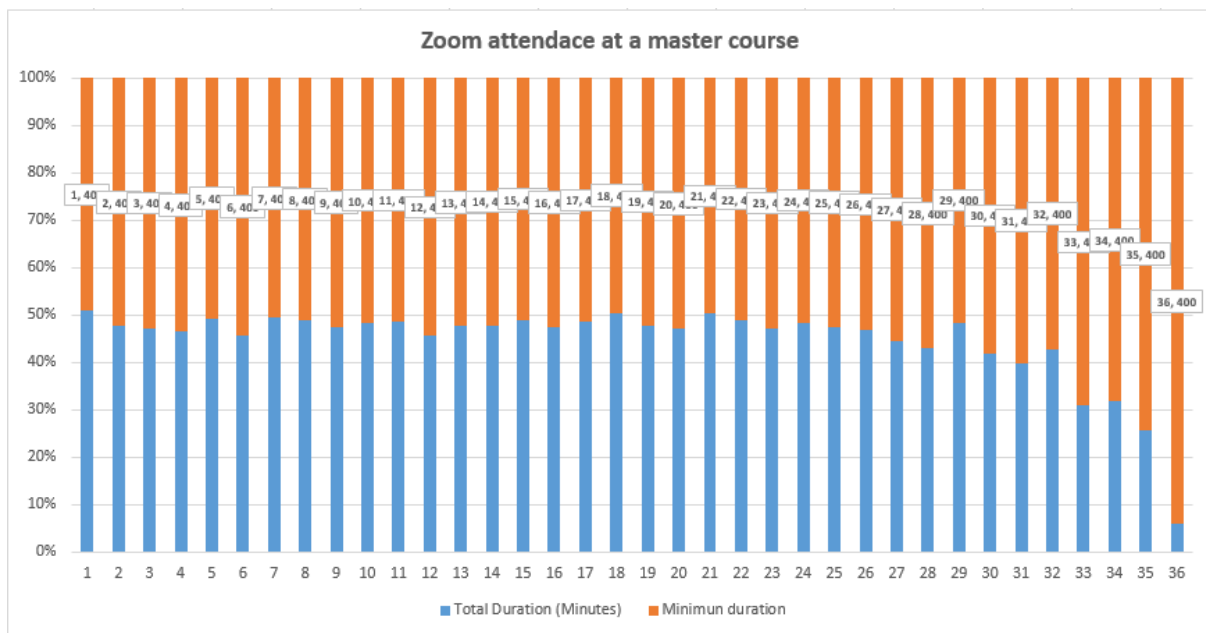


Fig. 1. An example of a master class's Zoom attendance data [4]

As a result, teacher interaction with students in the web - based learning environment is a significant problem.

As mentioned in [3], *Virtual Reading Rooms* (VRR) and *Virtual Teaching Spaces* (VTS) are new services that arose as a result of the COVID-19 pandemic. Despite their origins as a realistic response to building closures during various local, regional, and national lockdowns, VRRs and VTSs have become created as useful routes through which GLAM (galleries, libraries, archives, and museums) and universities can engage with different participants through virtual classroom meetings. The differences between VRR and VTSs are the related to use, application, destination and audience. While the VRR solutions are a bespoke research service between individuals, the VTSs allow the delivery of content to groups within a learning

or teaching environment [10].

Scientists, research professors, and members of the public can digitally view and interact with an institution's cultural heritage and collections by using live broadcasts through physical reading rooms and learning facilities provided by GLAM institutions, requesting that they be positioned and questioned by a staff member to allow them to be researched or learned.

Virtual Reading Rooms, Virtual Teaching Spaces and also Virtual Exhibitions are new services that have grown in popularity as a result of the COVID-19 pandemic.

3. Existing Solutions for the Management of COVID-19 Impact in the Educational System

The COVID-19 pandemic affected the entire world. During this period most of the

universities and cultural institutions around the world had decided to close for a period, and move to the online environment. The educators' deciders had tried to find the best solutions for this situation. During this period many cultural institutions and universities tried to find solutions for helping the students to access the information and for better interaction. Several studies ([12], [13], [14]) highlight that the most used solutions during COVID-19 pandemic period were Virtual Reading Rooms and Virtual Teaching Spaces. Manchester University brought a set of logistical and technical solutions and encouraged innovative human challenges from the beginning of the pandemic period. Manchester University and Manchester Library University provide access to VRR service since July 2021 [12]. Since then, they delivered over 235 sessions.

The students from the University of Economics in Slovakia can use the Virtual Reading Room [15] for documentation and

interaction. The Slovak Economic Library, even before the pandemic period, established a VRR service (Virtual Reading Room - EUBA) which offer the access to over 400 digitized publications [19].

According to [14], Reading University procured in September 2020 a Virtual Reading Room to enable the access to more online content. This solution increased the digital access and helped to better interaction of the students and help them to read more books.

From the beginning of pandemic period, Trinity College from Dublin had the priority the safety of staff and students, but in the same time they had wanted to facility the access at the resources for the continuity of the educational process. They invested in online library [16] (Figure 2), virtual consultations and online content and the result was that they continued to offer to the student's good facilities to learn.



Fig. 2. Virtual Trinity Library – Trinity College Dublin [16]

In the last century, most of the universities, libraries and cultural institutions transformed the physical content in a digital one, but the pandemic period accelerated this process and the virtual reading room and virtual teaching

spaces seem to be a real solution for future education and research.

Also, the University of Reding started a VRR service in September 2020 [20], providing access to Special Collections, Art Collections

and Museum of English Rural Life (The MERL).

In 2021 Research Libraries UK published a report [10] in which they had made an international survey regarding the development and delivery of VRR and VTSs services. They received responses, from 32 institutions which highlighted the preoccupation regarding the virtual solutions for these universities and cultural institutions. Some of organizations already implemented

such kind of services and they want to improve them (56% have a VRR and 38% have a VTS), and other want to create them (44% intend to create a VRR, 63% intend to create a VTS). This report let us to see the big impact and the necessity of VRRs and VTSs in the pandemic period. A high number of these services had been created as a result of the COVID 19 pandemic, because they represent a real support for learning an evolution (figure 3).

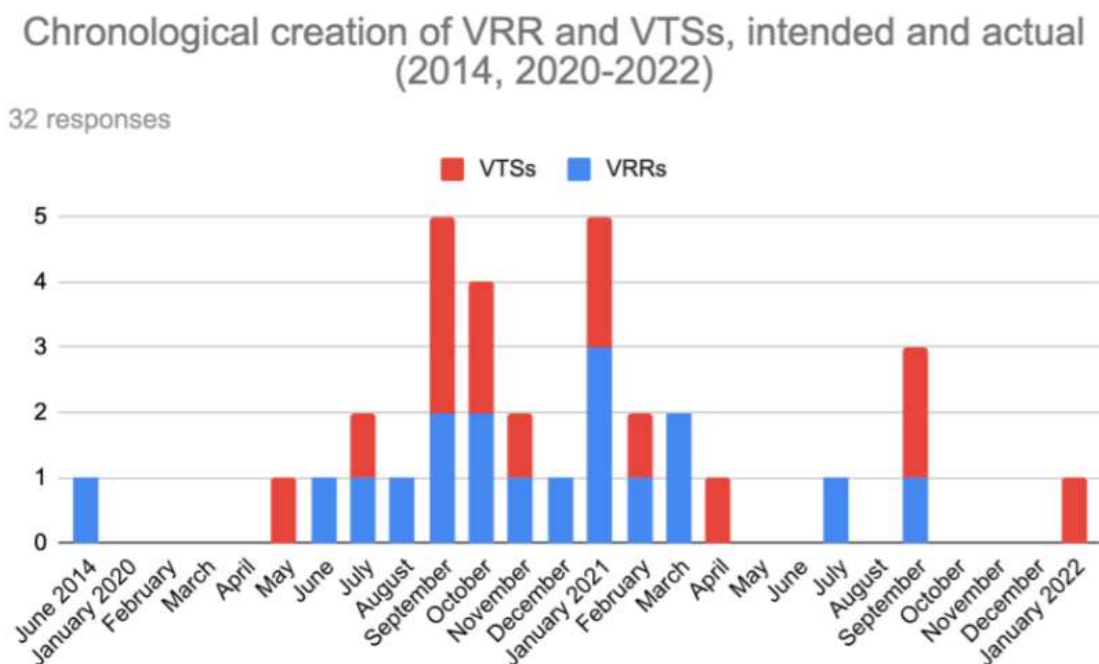


Fig. 3. Creation of VRR and VTSs [10]

Most of the institutions try to implement both VRR and VTS and they have different teams who manage these kinds of services.

During the pandemic period, VTSs represented an important support in the delivery of teaching and learning content, and they have become a very used method in universities for improving the on-line education.

4. Virtual Exhibitions - One of the Ways to Mitigate the Impact of the Crisis

Virtual exhibitions (VE) are among the

several IT (Information Technology) implementations that are compatible with the fundamental concepts of Digital Humanism. The goal of this paper is to present the concepts and techniques of VE, with an emphasis on the modifications caused by the current COVID-19 epidemic.

A virtual exhibition developed at the Romanian Academy Library (figure 3) was analyzed using Google Analytics.

ROMÂNIA - FRANȚA - Itinerarii culturale

Expoziție virtuală



Fig. 3. A Virtual Exhibition at Romanian Academy Library

Given that the COVID-19 restrictions in Romania began on March 22nd, 2020, we studied data before and after the restrictions. The statistics in Table 1 below are for both periods, before and after March 22nd, 2020.

The specific situation of Romania demonstrates an increase in the number of users and sessions following the implementation of COVID-19 limitations.

Table 1. Number of users and sessions per country and browser access

Country	Date Range	Total		Chrome		Safari		Android Webview		Firefox		Samsung Internet	
		Users	Sessions	Users	Sessions	Users	Sessions	Users	Sessions	Users	Sessions	Users	Sessions
Romania	Jan 1, 2018 - Mar 22, 2020	857	1014	562	674	69	76	77	84	70	93	26	27
Romania	Mar 23, 2020 - Jul 23, 2021	1186	1540	837	1102	132	177	10	10	82	97	63	72
United States	Jan 1, 2018 - Mar 22, 2020	53	53	4	4	41	41	1	1	1	1	0	0
United States	Mar 23, 2020 - Jul 23, 2021	51	53	10	10	36	38	0	0	2	2	0	0
Moldova	Jan 1, 2018 - Mar 22, 2020	30	38	22	26	4	4	0	0	1	1	1	5
Moldova	Mar 23, 2020 - Jul 23, 2021	34	44	25	29	3	3	0	0	2	2	3	9
Italy	Jan 1, 2018 - Mar 22, 2020	15	15	12	12	0	0	1	1	2	2	0	0
Italy	Mar 23, 2020 - Jul 23, 2021	18	19	11	11	3	3	1	1	2	3	0	0
Germany	Jan 1, 2018 - Mar 22, 2020	14	18	9	13	0	0	1	1	0	0	0	0
Germany	Mar 23, 2020 - Jul 23, 2021	15	21	7	10	4	7	0	0	4	4	0	0
United Kingdom	Jan 1, 2018 - Mar 22, 2020	12	14	5	7	2	2	4	4	0	0	0	0
United Kingdom	Mar 23, 2020 - Jul 23, 2021	17	17	10	10	3	3	1	1	0	0	2	2
France	Jan 1, 2018 - Mar 22, 2020	9	9	6	6	1	1	0	0	2	2	0	0
France	Mar 23, 2020 - Jul 23, 2021	13	13	6	6	3	3	0	0	4	4	0	0
Spain	Jan 1, 2018 - Mar 22, 2020	7	7	3	3	1	1	2	2	0	0	0	0
Spain	Mar 23, 2020 - Jul 23, 2021	7	7	5	5	0	0	1	1	1	1	0	0
Belgium	Jan 1, 2018 - Mar 22, 2020	4	4	1	1	0	0	2	2	0	0	0	0
Belgium	Mar 23, 2020 - Jul 23, 2021	5	6	3	4	1	1	0	0	1	1	0	0
Poland	Jan 1, 2018 - Mar 22, 2020	4	4	2	2	0	0	0	0	1	1	0	0
Poland	Mar 23, 2020 - Jul 23, 2021	5	10	3	8	0	0	0	0	0	0	0	0
Brazil	Jan 1, 2018 - Mar 22, 2020	3	3	2	2	0	0	0	0	0	0	1	1
Brazil	Mar 23, 2020 - Jul 23, 2021	5	6	2	2	0	0	0	0	0	0	3	4
Hungary	Jan 1, 2018 - Mar 22, 2020	3	3	1	1	0	0	0	0	2	2	0	0
Hungary	Mar 23, 2020 - Jul 23, 2021	9	15	4	4	0	0	0	0	5	11	0	0

Because our analysis is focused on what happened in Romania, we colored with yellow, orange, red and green the number of users and sessions for different browsers accesses. In terms of total number of users and sessions, it was an increase after March 22nd, 2020, so after the restrictions and COVID-19 limitations were introduced. Regarding the most used browser, which has influence on types of devices from which the virtual exhibition was accessed, we see something interesting: Chrome registered an increase, while Android WebView a decrease after March 22nd, 2020. If we check the data at the international level,

there were no significant changes before and after the mentioned date, because the virtual exhibition taken into consideration it is well-known in Romania, the content is in Romanian and, by consequence, the number of users from other countries was reduced. According to Europeana DSI-4 Multilingual Strategy [5], in a virtual exhibition is recommended to integrate trusted vocabularies that come with existing multilingual coverage of metadata, as well as real-time translation services from English to fill translation gaps. Figure 4 below presents how data evolved in terms of desktop versus mobile access.

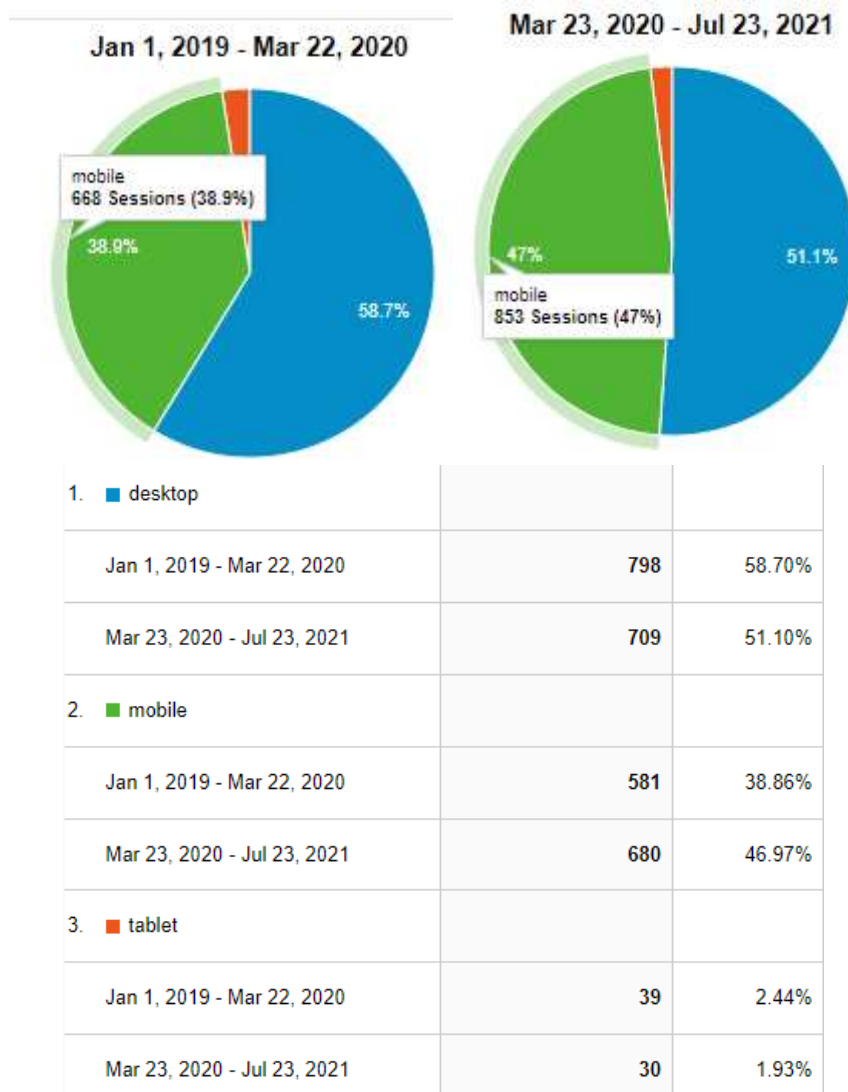


Fig. 4. Desktop versus mobile access for a virtual exhibition

Figure 4 shows that following the COVID-19 restrictions, the number of mobile sessions

increased while the number of desktop sessions dropped. It's important to note that

the number of tablet accesses has maintained at the same reduced level.

The use of tablets is not so high, even if for accessing a virtual exhibition it is recommended to use devices with big screens, in order to benefit from the experience provided by image galleries and storytelling solutions.

According to [6], the COVID-19 pandemic is more than a health issue. This is already a crisis with serious consequences for the most vulnerable individuals and professionals working in museums and other cultural institutions. During this time, many countries have attempted to implement virtual exhibitions, virtual reading rooms, virtual teaching spaces and so on, in order to mitigate losses caused by the closure of schools, museums, permanent physical exhibitions, as a result of worldwide societal prohibitions.

The benefits of virtualizing museum interiors to the audience in order to analyze certain crucial components that they would not have detected with the visual inspection within the structure are presented in [7], as are the constraints of such a depiction. One problem is that visitors to the museum will not get the same experience as they would at the actual place.

According with [8], the European Commission presented a vision and avenues for Europe's digital transformation by 2030. The Commission encourages Member Countries to digitize all monuments and sites at risk of deterioration, as well as half of those heavily visited by tourists, by 2030.

This recommendation will help to achieve the Digital Decade Goals by fostering a secure and sustainable digital infrastructure, training digital skills, and encouraging businesses, particularly SMEs, to use new technologies.

The European Commission has issued a recommendation [9] on a Common European Data Area for Cultural Heritage. The goal of this suggestion is to hasten the digitization of Europe's cultural resources.

The Committee considers that Member Countries accelerate the digitization of all monuments and sites, objects and artifacts of cultural identity for coming generations, take

the appropriate preservation and protection measures for those in danger, and encourage the re-use of these digital collections in areas like education, sustainable tourism, and creative cultural industries [9].

5. Conclusions

In times of crises, culture is more vital than ever. In the context of unexpected and challenging conditions, culture is boosting our societies' resilience. The COVID-19 crisis's harmful effects on the cultural and creative sectors should be minimized.

Broadly speaking, due to the strong evidence provided here on the influence of societal and cultural backgrounds on young people's educational and technological outlooks, identifying the potential efficiency of any distributed decision-oriented or design-oriented attempt from the standpoint of adjustment to the discussed contexts is highly valuable.

Despite being a pragmatic response to the lockdown of search rooms during the COVID-19 outbreak, the development and implementation of Virtual Reading Rooms, Virtual Teaching Spaces and also Virtual Exhibitions has the potential to have a considerable impact on the conduct of collection-based studies across sectors. VRRs and VTSs provide interesting possibilities for collection-based research by enabling academics, students, and community members to participate in original teaching and research using physically distributed collections, and to communicate with these in an adaptable and humanly mediated manner. They also provide new chances for researchers and institutions to collaborate [3].

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