REFLECTIVE ANALYSIS

Exploring the Contributions and Challenges of Museum Technology Professionals during the COVID-19 Crisis

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Abstract This paper presents results from an online survey designed to explore the role of museum technology professionals during times of crisis such as the COVID-19 pandemic. The survey results offer an important first look at the contributions and challenges of museum technology professionals during a critical turning point in the history of museums. The analysis of these results provides insight into how museum technology professionals are affected during times of crisis, the contributions they can make to museums in crisis, and how they can better advocate their value to museum leadership in crisis situations. The research results demonstrate the need for museums to promote digital literacy skills, increase their investment in digital technologies, and develop the digital strategies they will need to respond to future crises head on.

The COVID-19 pandemic placed immense stress on museums worldwide as they were forced to adapt to many difficult new realities (AAM, 2020a; ICOM, 2020; UNESCO, 2020). Despite their best efforts to keep remote audiences engaged by moving their resources and events online, museum professionals faced massive layoffs as museums were forced to cut budgets and consolidate to core personnel (AAM, 2020b; Cascone, 2020). One sector that has been negatively affected by these challenges is the museum technology sector (Moskowitz, 2020), defined as the community of technology professionals who work in museums (Marty et al., 2013). This means that the very people who might be best positioned to help museums adapt to the realities of the pandemic, especially in the digital age, are also among the many museum professionals who lost their jobs as a result of the pandemic.

Given the challenges faced by museums during the COVID-19 pandemic, the museum layoffs that accompanied these challenges, and the unique situation faced by museum technology professionals, there is a need to assess how the museum technology sector is affected during times of crisis, the contributions this sector can make to museums, and how this sector can better advocate its value to museum leadership. To meet this need, this paper presents results from an online survey that was designed to explore the role of museum technology professionals during times of crisis such as...
COVID-19. The results of this study will help museum researchers, museum professionals, and museum leaders better understand the contributions of museum technology professionals in crisis situations, and how museums can better take advantage of those contributions during future crises.

BACKGROUND

Museums and museum professionals have faced many crises throughout history (cf. O’Doherty, 1972). This background section provides an overview of how museums respond to times of crisis in general, followed by how museums responded to the COVID-19 pandemic in particular.

Museums and Museum Professionals in Times of Crisis

As memory institutions providing access to the art, science, history, and culture of humanity, museums are vulnerable to a wide range of crises. Museums’ operations are supported by a combination of admissions revenue, philanthropic donations, public funds, and endowment earnings. These revenue streams in turn are sensitive to fluctuations in the global economy, and as a result, financial recessions have the potential to threaten the fiscal health of museums worldwide (Lindqvist, 2012). This vulnerability was demonstrated during the 2008 economic crisis, during which museums were devastated by cuts in public funding, reduced donations, and shrinking endowments (Rizzo, 2010). Those hit hardest by these cuts were museum employees, who often suffered pay cuts, reduced hours, or job loss. Museums can also be slow to recover from economic crises; after the 2008 crisis, for example, nearly five years passed before museum directors started showing cautious optimism in improving budgets (AAM, 2013).

Despite these challenges, museum professionals typically demonstrate extreme resilience during times of crisis. The American Alliance of Museums, for example, reported that museum attendance actually increased during the 2008 economic crisis, suggesting that museums may serve as a safe haven for their communities during times of uncertainty (AAM, 2010). Similarly, Johns Hopkins University found that museums serving vulnerable populations such as children, the elderly, the economically disadvantaged, and people with disabilities consistently maintained or even increased service levels despite declining resources (Geller et al., 2010). As the International Council of Museums noted, museums are ideally positioned to “strengthen cultural identities, support social cohesion and develop intercultural mediation—activities which are fundamental in times of crisis” (ICOM, 2013).

Museum professionals accomplish these feats in challenging times not just through aggressive fundraising and belt-tightening, but also by developing creative entrepreneurial initiatives to carry their museums through the crisis. Museum technology professionals in particular play a key role in helping museums find new ways of reaching their audiences during times of crisis (McGrath, 2020). For many museums, having employees with the digital literacy skills to work with new technologies and develop new methods of audience engagement and outreach becomes critically important as
crises place limitations on their traditional work processes. As Anderson (2018) argues, “the use of new technologies within these processes is increasingly important for reconceptualising museum visitors and audiences, particularly as media becomes more firmly woven into people’s lives and museum experiences” (p. 81).

Despite these contributions, the museum technology profession remains a vulnerable and often undervalued sector of museum operations. Historically, this likely stems from institutional hierarchies that favor staff who work directly in support of the physical collection over museum professionals who are responsible for digital resources, audience engagement, educational outreach, or the visitor experience (Marty, 2007). Despite the proven effectiveness of digital initiatives, many museum administrators are still likely to measure success by the number of in person visits to the museum rather than digital metrics such as website views or social media interactions. These preferences result in a perception that museum technology professionals (along with visitor services, educators, etc.) are secondary to “core” museum personnel (such as curators). This underlying view of museum technology work as being ancillary to the museum’s core functions is often exposed when crises occur that require fiscal belt-tightening.

Camarero et al. (2011) found that larger, more financially secure museums are more likely to invest in technological innovation, arguing that “larger museums have more human and financial resources available to engage in change” (p. 262). In contrast, museums facing financial struggles may revert to older models that favor in-person visits and collections maintenance over digital outreach (Small, 2020). This relationship between financial resources and technological investment means that “non-essential” sectors are often the first to be cut in crisis situations. When budgets are tight, museums looking to expand their digital initiatives might choose to invest in new technologies (often in the form of one-time hardware and software purchases), but be unable to hire additional personnel to operate these technologies (especially since personnel hires typically require recurring budget expenses). Unfortunately, this approach puts additional strain on existing technology employees who are forced to adopt and support unfamiliar technologies without the help of additional staff.

As museum technology professionals struggle to prove the value of their work to museum leadership, they are frequently undermined by the invisible nature of their efforts. Digital initiatives involve painstaking, behind-the-scenes work that is often imperceptible to museum visitors and museum leadership. The more museum technology professionals work in a world of ubiquitous, and seemingly free, digital content, the more their efforts remain vulnerable to undervaluing, particularly during times of crisis (Marty, 2016). Museum directors facing hard choices in the distribution of diminished assets are more likely to exclude sectors that are out of sight. “When organizations are restructured and work is reorganized, invisible but valuable work is often eliminated. No one recognizes that it is being done, or that it is of value, so the time and personnel it requires are not allotted in new plans” (Nardi & Engeström, 1999, p.1). In times of crisis, invisible work can be precarious work.
Museums and Museum Professionals during the COVID-19 Pandemic

Museums around the world faced an unprecedented crisis in 2020 as the global COVID-19 pandemic spread from country to country. As health officials urged social distancing to stop the spread of the virus, nearly 90% of museums worldwide closed their doors to the public (ICOM, 2020). Slashed admissions revenue coupled with reduced earnings from space rentals, cafe and retail sales, investment earnings, and philanthropic donations placed an immense economic burden on museums. The American Alliance of Museums estimated that museums nationwide were losing $33 million a day due to pandemic-related closures, and found that more than half the nation’s museums were forced to lay off or furlough staff (AAM, 2020b). Alarmingly, a survey of museum directors conducted in June 2020 found that up to one third of all museums faced permanent closure as a result of the pandemic (AAM, 2020a).

In the United States, temporary relief for museums was provided through the CARES Act Paycheck Protection Program in March 2020, but with no further relief anticipated by the federal government, the future appears bleak for the museum sector. According to the American Alliance of Museums, “on average, individual museums through October lost about $850,000 in revenue in 2020 due to the pandemic” (AAM, 2020b). In light of these budgetary constraints, many museums have had to make substantial reductions in staff. In June 2020 alone, nearly 1,500 museum workers lost their jobs as portions of the CARES act expired (Cascone, 2020). Additional layoffs occurred throughout 2020, and an estimated 42% of pandemic-related layoffs could be permanent (Barrero et al., 2020). This “brain drain” places museums at great risk of losing decades of institutional knowledge as museum professionals, including museum technology professionals, migrate to other fields (Small, 2020).

As museum directors face the difficult task of weighing which workers are essential to museum operations as budgets shrink, many of those included in staff layoffs are the very employees who are best suited to carry museums through the COVID-19 pandemic. For example, key services provided during pandemic-related closures included virtual educational programs, experiences, and curricula specifically designed to reach students, parents, and teachers online, yet despite the clear value of these services, two-thirds of museum directors anticipate cuts in education, programming, and other public services due to financial hardship (AAM, 2020a). As Small (2020) notes, “budget shortfalls have resulted in a regression of priorities in many museums, where once-growing fields like digital media and education are being targeted for cuts.” Museum directors facing pressures to consolidate their resources to essential personnel often reduce staff to those who work with physical collections as opposed to technology professionals who can reach remote audiences. While museums might invest in new communication technologies necessary to support the transition to remote work during the pandemic, these investments are often accompanied by a reduction in the actual personnel needed to operate new technologies and support museums through the crisis.

Despite these challenges, museum technology professionals remain uniquely positioned to support museums during pandemic closures through digital outreach and audience engagement. As the COVID-19 pandemic struck, and museums shifted from encouraging physical visitation to creating...
equally compelling virtual interactions online, many museum technology workers rallied to provide creative and engaging digital programs (McGrath, 2020). While preliminary reports indicate that digital outreach is more essential than ever, little is known about how museum technology professionals have been impacted by COVID-19. Informal reports via social media posts and personal blogs suggested that museum technology professionals faced immense job instability as a result of the COVID-19 pandemic. However, no formal study to date has examined the direct effect of this crisis on this vulnerable sector, nor the factors that may contribute to the deprioritization of museum technology professionals during times of crisis. There is a critical need, therefore, to explore how museum technology professionals have contributed to their museum’s core mission in response to the COVID-19 crisis, and the challenges they faced as a result of the pandemic.

METHODS

After a thorough examination of the literature, a gap emerges regarding the potential contributions of museum technology professionals during times of crisis and the challenges they face in demonstrating their value to museum leadership. To address this gap in the literature, this study examines the following research questions:

1. What are the contributions the museum technology sector can make to museums during times of crisis such as COVID-19?

2. How is the museum technology sector affected during times of crisis such as COVID-19?

3. How can the museum technology sector advocate its value to museum leadership during times of crisis such as COVID-19?

To answer these questions, the researchers developed an online survey that invited participants to answer questions about how the museum technology sector is affected during times of crisis, the contributions this sector can make to museums, and how this sector can better advocate its value to museum leadership. The survey included three Likert scale questions, three multiple-choice questions, one open-ended, text entry question, and three demographics questions. The Likert scale and multiple-choice questions were grouped into three sets of two questions each. All survey instruments, consent forms, and study procedures were reviewed and approved by the university’s institutional review board.

Survey Instrument

The first set of survey questions were intended to address the first research question, which explores the idea that over the past few decades, the museum technology sector has contributed new tools, technologies, and strategies for engaging audiences and connecting communities. The survey
asked *How valuable are the contributions that the museum technology sector can make to a museum’s core mission during times of crisis such as COVID-19?* Survey respondents were asked to choose from a Likert scale ranging from “extremely valuable” to “not at all valuable.” Survey respondents were then asked to identify the most valuable contributions that the museum technology sector can make to a museum’s core mission during times of crisis such as COVID-19, and were given eight possible responses to select from to answer this question (see below for the survey responses).

The second set of survey questions were intended to address the second research question, which explores the idea that despite the best efforts of the museum industry, times of crisis have the potential to negatively affect the revenue of museums and the job security of museum employees. The survey asked *How likely is the museum technology sector to be negatively affected by financial struggles in times of crisis such as COVID-19?* Survey respondents were asked to choose from a Likert scale ranging from “highly likely” to “highly unlikely.” Survey respondents were then asked to identify the most significant factors that contribute to the museum technology sector being negatively affected by financial struggles in times of crisis such as COVID-19, and were given eight possible responses to select from to answer this question (see below for the survey responses).

The third set of survey questions were intended to address the third research question, which explores the idea that as budgetary deficits force museums to reduce staff to essential workers, different sectors within the museum industry seek to advocate their value to the museum’s core mission. The survey asked *How effective is the museum technology sector at advocating its value to museum leadership in times of crisis such as COVID-19?* Survey respondents were asked to choose from a Likert scale ranging from “extremely effective” to “not at all effective.” Survey respondents were then asked to identify the most effective ways the museum technology sector can advocate its value to museum leadership in times of crisis such as COVID-19, and were given eight possible responses to select from to answer this question (see below for the survey responses).

The survey then asked the participants to share any additional thoughts they might have about how the museum technology sector is affected during times of crisis, the contributions this sector can make to museums during times of crisis, or how this sector can better advocate its value to museum leadership during times of crisis, and were provided a text entry field for comment. Finally, the respondents were asked three demographics questions regarding their relationship with museums, their involvement with the museum technology sector, and their years of experience in the museum field (see below for the specific questions and answers).

**Data Collection and Analysis**

The survey was advertised widely during the month of October 2020 through social media (specifically Facebook and Twitter), and disseminated on the listserv of the Museum Computer Network professional organization. The researchers hoped to reach a range of participants willing to share their thoughts on the role of museum technology professionals during times of crisis, particularly
those participants affiliated with museums or who worked (or had worked) in the museum technology sector. The invitations to participate included hashtags that were intended to reach the #muse-tech, #museweb, #musesocial, and #museumcn online communities, each representing hundreds of museum technology professionals worldwide.

The survey was developed and disseminated using Qualtrics, an online survey software program. Data collected through Qualtrics were analyzed using Excel to generate descriptive statistics for the numeric responses. The open-ended comments provided by the survey participants were independently sorted and coded by the authors to determine how these responses connected to the study’s research questions. While there were insufficient numbers of free text responses for a full-scale qualitative data analysis, this identification of which open-ended responses matched which research question proved useful for illuminating the answers to the other survey questions.

The survey responses (see below) speak to the limitations and challenges of administering an online survey to reach a specific population at a very stressful moment in history. The month of October 2020 was a very critical time for the museum technology sector, particularly in the United States, coming after the end of federal funding intended to help museums weather the pandemic (and the many museum layoffs that occurred during summer 2020), and before the presidential election in November 2020 (which itself had serious implications for the financial future of museums). The results of this survey, therefore, should be viewed as exploratory data capturing a unique and fraught moment in the history of museums, as mass layoffs have forced thousands of dedicated museum professionals to leave the field.

**FINDINGS**

The survey ran from October 6 to November 2, 2020, and during this time, the survey received 34 complete responses. While these survey responses cannot be considered representative of the population of museums and museum technology professionals as a whole, they are important for capturing point-in-time insights from seasoned museum professionals who have extensive experience with museums and who shared their thoughts on this crisis. The highly detailed open-ended contributions gathered as part of this survey also shed a valuable light on the thoughts and perspective of museum technology professionals during the COVID-19 pandemic. The following section presents the findings from survey responses as they relate to the original research questions. The implications from these findings for museum technology professionals and museum leadership are further analyzed in the Discussion section below.

**Participant Demographics**

When asked to describe their relationship with museums (Table 1), their involvement with the museum technology sector (Table 2), and their years of experience in the museum field (Table 3),
survey respondents predominantly described themselves as museum professionals (71.4%), with consultants (14.3%) and library, archives, and other memory institution professionals (8.6%) following in second and third place respectively. The majority of the respondents stated that they either currently (76.5%) or recently (5.9%) work in the museum technology sector. The vast majority of the respondents (88.5%) stated that they had at least five years of experience in the museum field, with nearly half the respondents (48.6%) having worked in the museum field for 20 years or more. These demographics demonstrate that the survey respondents have a strong and significant connection with museums and the museum technology sector.

While the survey instrument collected participants’ demographic data including their involvement with the museum technology sector and their years of experience in the field, no additional data on the types of museums represented, nor the specific positions held by respondents within their museum’s operations, were gathered. However, the survey was distributed directly via the Museum Computer Network listserv as well as through social media posts using targeted hashtags such as the #musetech, #museweb, and #musesocial. These channels of distribution increased the likelihood of the survey reaching professionals actively involved in museum computing, including museum technology professionals, social media managers, and digital marketing strategists within the cultural heritage sector.

### Contributions of the Museum Technology Sector

This section presents findings on the issues addressed in Research Question 1. When asked about the value of the contributions that the museum technology sector can make to a museum’s core
mission during times of crisis (Table 4), 100% of the survey respondents agreed that those contributions were either extremely valuable or moderately valuable. When asked to identify the most valuable contributions that the museum technology sector can make to a museum’s core mission during times of crisis out of a list of eight possible responses (Table 5), survey respondents indicated that the most valuable contribution that this sector can make was “Providing remote access to information about the museum’s collections and resources.” This was closely followed by “Expanding the museum’s ability to reach new audiences through new technologies,” “Connecting museum staff and museum visitors through communication technologies,” and “Engaging the museum’s audiences through relevant online activities.”

These responses make it clear that the best way for museum technology professionals to contribute in times of crisis is through audience engagement and online outreach. Providing access to information online, reaching new audiences through communication technologies, and engaging those audiences with online activities are important activities at times when a museum might be forced to close to the public, and needs to find new methods of remaining relevant to and connected with its community (Anderson, 2018; Proctor, 2010).

The open-ended comments reinforced this focus on engagement and outreach for the museum technology professional, with several survey respondents mentioning the importance of finding new ways to connect with the museum’s community. One participant noted the shifting goals of audience engagement, stating “This crisis has provided evidence for the value of online tech in staying connected with audiences and reaching new audiences.” While museum closures allowed some

| How many years of experience have you had in the museum field? | %  | n  |
|---------------------------------------------------------------|----|----|
| 20 years or more                                              | 48.6| 17 |
| 15–19 years                                                   | 8.6 | 3  |
| 10–14 years                                                   | 14.3| 5  |
| 5–9 years                                                     | 17.1| 6  |
| Less than 5 years                                             | 8.6 | 3  |
| None                                                         | 2.9 | 1  |

Table 3.
Years of Experience in Museum Field

| How valuable are the contributions that the museum technology sector can make to a museum’s core mission during times of crisis such as COVID-19? | %  | n  |
|-----------------------------------------------------------------------------------------------------------------|----|----|
| Extremely valuable                                                                                              | 88.2| 30 |
| Moderately valuable                                                                                            | 11.8| 4  |
| Slightly valuable                                                                                               | 0   | 0  |
| Not at all valuable                                                                                            | 0   | 0  |

Table 4.
Value of Contributions
technology workers to engage with their audiences in new and exciting ways, other respondents expressed frustration at museum leadership’s hesitation to adopt new strategies for virtual outreach. As one participant noted, “Museums have not taken advantage of the crisis to focus on sustainable technical development and digital infrastructure. . . . I think museums are too fixated on replicating its in-person experiences online, and particularly in producing live programming that does not seem to be particularly well attended.” Another participant astutely noted that museum technology workers were the ones who enabled the remainder of the museum staff to work remotely through the pandemic, stating “Within our museum, technology has sort of ‘proven itself’ through supporting work from home.”

Impacts on the Museum Technology Sector

This section presents findings on the issues addressed in Research Question 2. When asked about the likelihood that the museum technology sector will be negatively affected during times of crisis (Table 6), the vast majority (94.1%) of the survey respondents agreed that it is either highly or somewhat likely that this sector will be negatively affected. When asked to identify the most significant factors that contribute to the museum technology sector being negatively affected by financial struggles in times of crisis out of a list of eight possible responses (Table 7), survey respondents indicated that the most significant factor was “General misunderstandings about the time and effort museum technology projects require.” This was closely followed by “The tendency to undervalue museum technology work compared to other museum sectors,” “The invisible nature of the behind-the-scenes work of museum technology professionals,” “General misunderstandings about the responsibilities of museum technology workers,” and “The difficulty of conveying tangible indicators of success in museum technology projects.”

These responses make it clear that museum technology professionals are most likely to struggle in times of crisis due to an overall lack of understanding about the nature of museum technology projects and the responsibilities of museum technology professionals. There is no question that behind-

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Table 5. Most Valuable Contributions

What are the most valuable contributions that the museum technology sector can make to a museum’s core mission during times of crisis such as COVID-19? % n

| Contribution                                                                 | %  | n  |
|-----------------------------------------------------------------------------|----|----|
| Providing remote access to information about the museum’s collections and resources | 20.4 | 31 |
| Expanding the museum’s ability to reach new audiences through new technologies | 17.1 | 26 |
| Connecting museum staff and museum visitors through communication technologies | 15.8 | 24 |
| Engaging the museum’s audiences through relevant online activities           | 15.1 | 23 |
| Supporting the technical infrastructure that underlies the museum’s operations | 10.5 | 16 |
| Safeguarding the integrity of the museum’s information resources and technologies | 9.9  | 15 |
| Managing the museum’s strategic plan for digital operations                 | 7.2  | 11 |
| Documenting the response of the museum and its community to the crisis       | 4.0  | 6  |
The scenes technology work (in any organization, not just museums) is often invisible, and as such unsupported in times of crisis (Nardi & Engeström, 1999; Star & Ruhleder, 1996).

The open-ended comments reinforced these issues of museum technology work being undervalued, with several survey respondents mentioning the failure of museum leadership to prioritize digital initiatives. As one respondent reported, “I think one of the biggest struggles of the museum technology sector is the fact that it is often lumped in with other departments or roles. For example, I consider myself a part of the technology sector, but technically I’m a Communications Manager. This can affect response times, strategic planning and proper funding, as well as the ability to advocate worth and growth.” This lack of direct visibility when working on technology projects can lead to potential misunderstandings by museum leadership regarding the time and energy necessary to successfully implement digital strategies in museums.

**Advocating for the Museum Technology Sector**

This section presents findings on the issues addressed in Research Question 3. When asked how effective the museum technology sector is at advocating its value to museum leadership in times of crisis (Table 8), survey respondents were less enthusiastic: while slightly over half the respondents...
thought this sector was moderately effective (51.5%), three times as many respondents thought the sector was either slightly effective or not at all effective (36.4%) than thought it was extremely effective (12.1%). When asked to identify the most effective ways the museum technology sector can advocate its value to museum leadership in times of crisis out of a list of eight possible responses (Table 9), survey respondents indicated that the most significant factors were “Involving museum leadership in ongoing museum technology efforts or research” and “Providing metrics of audience engagement through interactive technologies.” This was closely followed by “Sharing examples of successful technology outreach initiatives by museums,” and “Documenting the need for and value of sophisticated digital strategies in times of crisis.”

These responses make it clear that for museum technology professionals to advocate their value to museums in times of crisis more effectively, they need to work more closely with museum leadership to increase overall understanding of the different ways in which the museum technology sector can contribute. It is hard to understand what one does not see, and therefore the more evidence that museum technology professionals can provide about their work and its impact, the better they will be able to advocate for their own value (Marty, 2016; Small, 2020).

The open-ended comments reinforced findings that the museum technology sector must work with museum leadership to agree on digital strategies. When asked how the museum technology

| How effective is the museum technology sector at advocating its value to museum leadership in times of crisis such as COVID-19? | % | n |
|-------------------------------------------------------------|----|----|
| Extremely effective                                         | 12.1 | 4 |
| Moderately effective                                        | 51.5 | 17 |
| Slightly effective                                          | 30.3 | 10 |
| Not at all effective                                         | 6.1 | 2 |

| What are the most effective ways the museum technology sector can advocate its value to museum leadership in times of crisis such as COVID-19? | % | n |
|-----------------------------------------------------------------------------------------------------------------|----|----|
| Involving museum leadership in ongoing museum technology efforts or research                                       | 18.7 | 25 |
| Providing metrics of audience engagement through interactive technologies                                       | 18.7 | 25 |
| Sharing examples of successful technology outreach initiatives by museums                                          | 15.7 | 21 |
| Documenting the need for and value of sophisticated digital strategies in times of crisis                           | 13.4 | 18 |
| Demonstrating how online outreach can help encourage in-person museum visits                                     | 11.9 | 16 |
| Making the behind-the-scenes work of museum technology workers more visible                                       | 11.2 | 15 |
| Conducting surveys of museum visitors to determine their use of technology                                        | 5.2 | 7 |
| Enlisting the help of professional organizations that support museum technology workers                             | 5.2 | 7 |
sector could better demonstrate its value one respondent answered, “Having museum leadership provide clear goals for its digital assets. This is a time where museum IT represents the public expression of the museum and needs the support of management to achieve those goals today and beyond.” Another respondent expressed frustration at what they perceived as a lack of support from museum leadership, noting “Museum boards need to come to the realization that digital is how modern institutions conduct the ‘business of museum’. Until then, they’ll largely continue to pick museum leaders who only view digital as a sidebar of their required skill sets.”

**DISCUSSION**

Based on the findings outlined above, this section discusses the survey results within the broader context of museum computing and offers actionable solutions to the issues presented within the findings. While these results are not generalizable to a wider population in museums as discussed above, the survey results do provide useful and timely data that present a stark picture of the state of the museum technology sector during the month of October 2020. Indeed, the number of survey responses itself speaks to the exhaustion of museum professionals as budgetary constraints place increasing hardships on cultural institutions, and is indicative of the community’s reluctance during this time of widespread museum layoffs and museum closures to touch what is clearly a raw wound for many museum professionals.

Despite these limitations, the answers to this study’s three research questions are clear. Despite the fact that the contributions of museum technology professionals during times of crisis are considered extremely valuable to museums (Research Question 1), the museum technology sector is highly likely to be negatively affected during times of crisis (Research Question 2). This apparent disconnect is perhaps best explained by the finding that the museum technology sector is only moderately effective at advocating its value to museum leadership during times of crisis (Research Question 3).

The implications of these findings for museum technology professionals and for museum leadership are discussed below. Within these implications, recommendations are offered for both museum technology professionals and museum leadership based on findings from the survey questions. These recommendations serve as actionable items to aid museum technology professionals in advocating their value (Research Question 3), and to assist museum leaders in realizing the full potential of digital initiatives (Research Question 1).

**Implications for Museum Technology Professionals**

When the COVID-19 pandemic struck, museum technology professionals, working hand-in-hand with education, visitor services, and other museum sectors, jumped into action, offering new methods for reaching visitors at a distance and new opportunities for engaging with audiences suddenly unable to visit the museum in person (McGrath, 2020). Yet when the funding ran out, these
same museum technology professionals were often among the first to be fired. This may be due in part to the perception that museum technology professionals are ancillary to the museum’s core mission. This is supported by one survey participant who expressed frustration at the museum technology sector being “lumped in with other departments or roles.” As budgetary constraints forced museum directors to focus on only essential staff, technology departments were often significantly downsized even as remaining employees were expected to reinvent their museum’s digital strategy and develop new digital experiences seemingly overnight.

For many museum technology professionals, this was naturally a frustrating experience, and this frustration was clearly visible online through their social media posts; as Moskowitz (2020) tweeted, “If you took all the people laid off in #Musetech and made one department, that department would be pretty awesome.” Similarly, after the AAM reported that two thirds of museums were cutting “education, programming, or other public services” despite the pivotal role of virtual educational experiences during the pandemic, Evjen (2020) tweeted, “Those are the museum professionals needed now. If you are laying off/furloughing them, you are doing it wrong.”

The results of this survey make it clear that museum technology professionals should focus on developing the necessary skills to advocate for their own value within their institutions, and conveying how their contributions can benefit their museums. The fact that museum technology work is often not understood in museums is problematic given that invisible work is often the first to be cut when organizations are forced to downsize. By involving museum leadership more closely in the ongoing work of the museum technology sector, and providing evidence of the effectiveness of their work, museum technology professionals have the opportunity to make their own accomplishments more visible within their institutions.

**Implications for Museum Leadership**

Times of crisis like the COVID-19 pandemic can be useful for highlighting the activities of museum technology professionals for museum leadership, especially those centered around audience engagement and outreach. This was a frequent topic of conversation during online meetings of museum technology professionals, such as the One-by-One (2020) workshops on “building digitally confident museums,” or the Museum Computer Network (2020) or Museums Computer Group (2020) conferences. While museum leadership has recognized the important role museum technology professionals were able to play during the COVID-19 pandemic, the question remains how to maintain this recognition post-crisis? Throughout 2020, many museum technology professionals wondered whether this “pivot to digital” would be a permanent change, or merely a temporary fix until the museums could “return to normal” after the pandemic?

Survey responses echoed the need for museum leaders who prioritize digital initiatives, with one respondent specifically calling for museums to hire leaders who view technology as more than a “side-bar” to museum operations. A recent report from the Knight Foundation (2020) on “digital readiness
and innovation in museums” found that museum leaders know they need technology professionals but either do not have them or are unable to support them. For example, the Knight Foundation noted that “leaders must make it a priority for their organizations to build a digital mindset […] yet across all museums only 11% have digital leaders as part of their senior management teams.” Likewise, the report stressed that “as more museums begin to make digital audience engagement a priority, the need for digitally focused staff will increase. [But ...] half of the institutions surveyed report having none or a just single digital staff person.”

The results of this research demonstrate that for museum leaders, the problems of digital leadership and the problems of surviving a crisis in the digital age represent two sides of the same coin. Both are problems that can be solved by museum technology professionals, and as a result, there is a need to find a way to invest in the education and digital strengths of one’s peers and employees, especially those who are best suited to help their museums navigate a crisis through online resources and online audiences. By reaching out to museum technology professionals and getting personally involved in technology projects, museum leaders can become proactive in shaping the digital strategic needs and interests of their institutions, and better position their museums to meet challenges moving forward.

CONCLUSIONS

The research data presented in this study offer an important first look at the contributions of and impact on museum technology professionals during a critical turning point in the history of museums. With up to a third of museums facing permanent closure, and significant layoffs affecting not only museum employees in general but technology professionals in particular, the museum profession finds itself at serious risk of losing a generation of knowledge about museum computing, digital technologies, audience engagement, and online outreach. But as with many crises, the COVID-19 pandemic can be seen as both a challenge and as an opportunity.

The results of this research shine a light on the need for museums to continue to develop the technology skills of their employees, and to increase their investment in museum technology. Given the wide range and demonstrated value of the contributions offered by museum technology professionals as identified in the survey responses, there is clearly a need for museums to invest in the digital literacy skills of museum staff members (Parry et al., 2018). And there is no question that this need is recognized by the museum technology sector. As one survey respondent noted, “digital is how modern institutions conduct the ‘business of museum.’”

As the need for comprehensive digital strategies and information policies in museums continues to evolve along with changing technologies and visitor expectations, it is imperative that museums have champions for digital technologies who can argue for the value of digital skills. Every museum will need someone suitably positioned to advocate for the information systems and technologies in use in museums and draw up a digital strategy that guides the museum’s use of technology in a way that meets the needs of museum visitors and museum staff. This will require a commitment from
museum leadership to invest not only in the technologies themselves, but also in the museum technology professionals who will be tasked with operating those systems and executing the museum’s digital strategy. This means that every museum will need to have a director who understands the importance of supporting digital technologies at all levels, inside and outside of the institution.

In times of crisis, museum technology professionals are able to provide the digital leadership that we know museums need and that we know few museums have. The COVID-19 pandemic made it clear that there is a need for museums to recognize museum technology professionals as essential museum employees. Likewise, there is a need for museum leaders to invest in the digital literacies skills of museum technology professionals. While additional research will be necessary in order to document the impact these efforts have on audience engagement and outreach during times of crisis, only by investing in the digital skills of their employees will museum leaders be able to position their institutions with the digital mindset and digital strategies needed to meet future challenges and respond to future crises head on.

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