

ABSTRACT

Organizational Resilience: Three Science Museums' Responses to COVID-19

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When faced with unexpected challenges, nonprofit organizations must demonstrate organizational resilience, which refers to an organization's ability to respond and adapt to disruptive change while maintaining its identity and functionality. While the study of nonprofit resiliency tactics and their effectiveness is increasingly popular, there is a gap in the literature about the ways museums specifically react in times of crisis. Using the nonprofit framework given by Searing et al., this study aims to identify the resiliency tactics used by three science museums during the COVID-19 pandemic. The findings suggest that museums should exercise careful financial and strategic planning, develop cohesive teams through communication and transparent conversations, and embrace innovation and collaboration.

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ORGANIZATIONAL RESILIENCE:
THREE SCIENCE MUSEUMS' RESPONSES TO COVID-19

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CHAPTER ONE

Introduction

The COVID-19 pandemic took the world by surprise. Looking back, it is easy to say that we might have expected or prepared for it considering the various health crises that are part of our history, but the reality is we were not ready for its widespread economic and social impact. Alongside the business and public sectors, the nonprofit sector was affected by the pandemic, and among the nonprofit organizations, museums struggled with reduced revenue, increased expenses, and an abundance of uncertainty.

In a special addition of the Informal Learning Review (ILR), several museum leaders discussed their experiences with the pandemic, but one interview suggested that preparing for the next crisis is prudent and achievable. Nik Honeysett, CEO of the Balboa Park Online Collaborative (BPOC), remarked, “To be sustainable, we must develop business plans with real resilience built into them... We need to plan for the next big disruption.”¹ Honeysett’s comment highlights two realities about the world. First, disruptive events will continue to occur, and second, museums need to be prepared for them. This requires resilience.

It is useful to note a few essential definitions before moving forward. First, organizational resilience refers to an organization’s ability to respond and adapt to

¹ Karen Wise, “Can Going Digital Save Us? An Interview with Nik Honeysett,” *Informal Learning Review* no. Special Issue 2020 #1 (2020): 43.

disruptive change while maintaining its identity and functionality.² It has been used in the business and management fields for over 40 years and was derived from the ecological use of “resilience.” When referring to “museum,” this paper will borrow the definition of museum from the International Council of Museums (ICOM):

A museum is not-for-profit, permanent institution in the service of society that researches, collects, conserves, interprets and exhibits tangible and intangible heritage. Open to the public, accessible and inclusive, museums foster diversity and sustainability. They operate and communicate ethically, professionally and with the participation of communities, offering varied experiences for education, enjoyment, reflection and knowledge sharing.³

Third, “COVID-19 pandemic” or “COVID-19” refers to the peak of the pandemic during the museums’ fiscal year 2020 (either July 1, 2019 to June, 30 2020 or October 1, 2019 to September 30, 2020) when museum closures were at their height.

A review of recent literature found that while the study of nonprofit resiliency tactics has grown (particularly in the healthcare field), there is little information about the ways museums react in times of crisis. Current studies about the effects of COVID-19 on nonprofits also do not consider museums. To address this gap in our understanding, this paper aims to answer the question: What tactics did museums use to successfully adapt to the challenges of the COVID-19 pandemic, and what can their actions teach us about organizational resiliency in museums?

Chapter 2 gives a brief overview of organizational resilience and its connections to nonprofits as well as the COVID-19 pandemic. Chapter Three outlines the research

²Hope Witmer and Marcela Sarmiento Mellinger, “Organizational Resilience: Nonprofit Organizations’ Response to Change,” *Work* 54, no. 2 (2016): 255.; Sandra Stötzer et al., “Coping with COVID-19 – Which Resilience Mechanisms Enabled Austrian Nonprofit Organizations to Weather the Pandemic Storm?,” *Schmalenbach Journal of Business Research* 74, no. 4 (December 2022): 499.

³“Museum Definition,” International Council of Museums, accessed May 4, 2023. <https://icom.museum/en/resources/standards-guidelines/museum-definition/>.

methods used. Chapter Four highlights the resiliency tactics discovered based on the five tactical themes (financial, human resources, outreach, programs and services, and management and leadership) given by Searing et al., and Chapter 5 discusses their implications on both theory and practice.

CHAPTER TWO

Theoretical Background and Current Research Insights

Foundations of Resilience

The concept of resilience is studied across a variety of disciplines and is highly context dependent.¹ Because of the broad use of the term resilience, its definition is not always consistent;² however, it typically refers to an entity's ability to respond and adapt to disruptive change while maintaining its identity and functionality.³ Resilience is also characterized by its application to many levels: individuals, teams, organizations, and broader systems (e.g., societies).⁴

The formal study of the term resilience began in the field of ecology in an article about ecological systems by C.S. Holling. His work highlights the difference between stability, which emphasizes equilibrium and the maintenance of a predictable world, and resilience, which refers to persistence through adaptation and the recognition of an unpredictable world.⁵ Holling later refined his definition of resilience as “the capacity of

¹Witmer and Mellinger, “Organizational Resilience,” 256.

²Martina K. Linneluecke, “Resilience in Business and Management Research: A Review of Influential Publications and a Research Agenda,” *International Journal of Management Reviews* 19, no. 1 (2017): 15.

³Witmer and Mellinger, “Organizational Resilience,” 255; Sandra Stötzer et al., “Coping with COVID-19,” 499.

⁴Witmer and Mellinger, “Organizational Resilience,” 256; Sandra Stötzer et al., “Coping with COVID-19,” 501.

⁵C.S. Holling, “Resilience and Stability of Ecological Systems,” *Annual Review of Ecology and Systematics* 4 (1973): 1-23.

a system to absorb disturbance and reorganize while undergoing change so as to still retain essentially the same function, structure, identity, and feedbacks.”⁶

The use of resilience in a business and management context can be traced back to two seminal papers. Staw et al. considered organizational responses to external threats but focused on the concept of “rigidity,” defined as “the tendency toward well-learned or dominate responses.”⁷ The authors suggest that rigidity within an organization has the possibility to lead to poor decision-making under conditions of threat.⁸ Meyer was the first to use “resilience” within a business and management context. Looking at organizational adaptations in hospitals to “jolts” such as a doctors’ strike, he concludes that ideology and strategy are greater predictors of adaptation than organizational structure or slack.⁹

Starting in the mid-1980s, however, the study of the impacts of external threats on organizations was ignored in favor of firm-internal considerations. This was largely in response to major accidents caused by internal failures, such as the Chernobyl nuclear disaster, Exxon Valdez oil spill, and the Space Shuttle Challenger accident. It was not until the 9/11 terrorist attacks that resilience research regained its focus on the impact of external events, particularly ones characterized by high environmental uncertainty, on

⁶B. Walter et al., “Resilience, adaptability and transformability in social-ecological systems,” *Ecology and Society* 9, no. 2 (2004): 5.

⁷Barry M. Staw, Lance E. Sandelands, and Jane E. Dutton, “Threat Rigidity Effects in Organizational Behavior: A Multilevel Analysis.” *Administrative Science Quarterly* 26, no. 4 (1981): 503.

⁸Staw, Sandelands, and Dutton, “Threat Rigidity Effects in Organizational Behavior,” 501.

⁹Alan D. Meyer, “Adapting to Environmental Jolts,” *Administrative Science Quarterly* 27, no. 4 (1982): p. 515.

organizational resilience. Research then splits into two streams: one focusing on managing employee strengths and the other on the adaptability of business models.¹⁰

For the purposes of this study, the adaptability of business models deserves further exploration. According to Linnenluecke, there are three highly-cited publications that summarize research in this particular area.¹¹ Drawing off of Staw et al., Sutcliffe and Vogus offer resilience as a countermeasure to rigidity and its maladaptive consequences. Further, they argue that the presence of enabling conditions such as broader information processing, loosening of control, and utilization of slack will increase the likelihood of positive adjustment to adverse conditions.¹² Hamel and Valikangas identify four challenges that an organization must overcome to become resilient: conquer denial, value variety (i.e., experiment and innovate), liberate financial resources, and embrace paradox.¹³ Gittell et al. explore the successful emergence of some airlines post-9/11 in an empirical case. The authors emphasize the importance of financial slack to organizational resilience, particularly to retain employees and sustain relationships with stakeholders that allow a quick return to normal operations.¹⁴ In sum, these articles explore, both conceptually and empirically, various enabling conditions and their effect on organizational resilience.

¹⁰Linnenluecke, "Resilience in Business and Management Research," 9, 11-12.

¹¹Linnenluecke, "Resilience in Business and Management Research," 12.

¹²K. M. Sutcliffe and T. J. Vogus, "Organizing for Resilience," in *Positive Organizational Scholarship: Foundations of a New Discipline*, ed. Kim S. Cameron, Jane E. Dutton, and Robert E. Quinn (San Francisco: Barrett-Koehler, 2003), 107.

¹³G. Hamel and L. Valikangas, "The Quest for Resilience," *Harvard Business Review* 81, no. 9 (2003).

¹⁴J.H. Gittell et al., "Relationships, Layoffs, and Organizational Resilience: Airline Industry Responses to September 11," *Journal of Applied Behavioral Science* 42, no. 3 (2006): 52-63.

Resilience in Nonprofits

In recent years, progress has been made toward understanding how organizational resilience is applicable to nonprofits. This progress includes several articles that do not specifically mention resiliency but are conceptually related, considering nonprofit persistence and adaptive tactics in the face of political hostility,¹⁵ decreased government funding,¹⁶ and economic downturn.¹⁷

On the other hand, there are a few empirical studies that link organizational resilience with nonprofits. Searing et al. examine the experiences of 31 human service nonprofits during the 2015-2017 Illinois Budget Impasse. The authors establish their “nonprofit resiliency framework,” which catalogues resilient behavior in five areas: financial, human resources, outreach, program and services, and management and leadership.¹⁸ Waerder et al. investigate collaborations between nonprofits and private-sector firms and the results of collaboration on nonprofit resilience during the 2015 German refugee crisis. The authors conclude that this collaboration produces stability, resources, expertise, and compassion which allows nonprofits to overcome resource-

¹⁵Howard Lune, “Weathering the Storm: Nonprofit Organization Survival Strategies in a Hostile Climate,” *Nonprofit and Voluntary Sector Quarterly* 31, no. 4 (2002): 463.

¹⁶Karl Besel, “The Role of Local Governmental Funding in Nonprofit Survival,” *Advances in Social Work* 2, no. 1 (2001): 39; J.-I. Soh, Elizabeth A. M. Searing, and Dennis R. Young, “Resiliency and Stability of the Zoo Animals” in *The Social Enterprise Zoo: A Guide for Perplexed Scholars, Entrepreneurs, Philanthropists, Leaders, Investors and Policymakers*, ed. Dennis R. Young, Cassidy V. Brewer, and Elizabeth A. M. Searing (Cheltenham, UK: Edward Elgar Publishing, 2016).

¹⁷Jennifer E. Mosley, Matthew P. Maronick, and Hagai Katz, “How Organizational Characteristics Affect the Adaptive Tactics Used by Human Service Nonprofit Managers Confronting Financial Uncertainty,” *Nonprofit Management and Leadership* 22, no. 3 (2012): 281.

¹⁸Searing, Wiley, and Young, “Resiliency Tactics during Financial Crisis,” 179.

based, conceptual, and emotional challenges more easily.¹⁹ Finally, Witmer and Mellinger study two behavioral health nonprofits. The authors identify six characteristics that indicate resilient behavior: commitment to mission, improvisation, community reciprocity, servant and transformational leadership, hope and optimism, and fiscal transparency.²⁰ While these articles are not related to the COVID-19 pandemic or to museums specifically, they highlight different resiliency tactics that nonprofits adopted in extreme and unpredictable contexts and emphasize the significance of collaboration with nonprofit stakeholders.

As one might expect, the COVID-19 pandemic inspired a new wave of research that examines resilient behavior in nonprofits in the context of the pandemic. Dayson et al. look at local community nonprofits supporting the elderly in the UK during the pandemic and categorize their experiences into the framework of absorptive (leading to persistence), adaptive (leading to incremental adjustments), and transformative (leading to lasting change) capacities. They find that innovation, sufficient resources, and a strong commitment to the mission are essential components to resilience during the crisis.²¹ Plaisance concludes that resilience in French arts and cultural nonprofits must be based on reform and requires stakeholder support. Plaisance emphasizes the importance of social capital over financial viability, but this emphasis is due to strong state-backed

¹⁹Rebecca Waerder et al., “The Role of Nonprofit–Private Collaboration for Nonprofits’ Organizational Resilience,” *Voluntas: International Journal of Voluntary and Nonprofit Organizations* 33, no. 4 (2022): 672.

²⁰Witmer and Mellinger, “Organizational Resilience,” 255.

²¹Chris Dayson, et al., “The ‘Resilience’ of Community Organisations during the COVID-19 Pandemic: Absorptive, Adaptive and Transformational Capacity during a Crisis Response,” *Voluntary Sector Review* 12, no. 2 (July 2021).

financial solutions for French nonprofits.²² Finally, Stötzer et al. investigate the resilience behavior of several Australian social and health services nonprofit organizations and, based on their results, create a framework that divides the main challenges (and subsequent resilience mechanisms) into four contexts: task, temporal, physical, and social. The authors identify several important mechanisms for nonprofit resilience, including financial slack, a strong commitment to mission, problem-solving skills, and supportive networks.²³ These recent articles provide a glimpse into the resiliency tactics that nonprofits of various types and origins used to contend with the array of challenges caused by COVID-19. However, examples of organizational resilience in American nonprofits (especially museums) are scarce.

There are several articles that discuss museums in combination with a topic tangential to organizational resilience. Lindqvist discusses the impact of economic crises on different forms of museum revenue (e.g., donations, endowments, etc.). She argues that fluctuations in the economy should not be a museum's main concern. Instead, they should focus on the management of long-term, stakeholder relationships, which reinforce legitimacy, broaden income base, and yield financial stability.²⁴ A joint project by the Summerlee Foundation and Dallas Heritage Village gives recommendations on financial sustainability to history organizations. Smith defines a sustainable organization as “one that, through beneficial circumstances and good professional practices, generates enough

²²Guillaume Plaisance, “Resilience in Arts and Cultural Nonprofit Organizations: An Analysis of the Covid-19 Crisis in France,” *Voluntas: International Journal of Voluntary and Nonprofit Organizations* 33, no. 5 (October 2022): 1015, 1025.

²³Stötzer et al., “Coping with COVID-19,” 512, 529.

²⁴Katja Lindqvist, “Museum Finances: Challenges beyond Economic Crises,” *Museum Management and Curatorship* 27, no. 1 (February 2012): 1, 9.

financial and community support to guarantee its continued existence on an indefinite basis” and argues that sustainable history organizations are typically well-positioned by circumstances (e.g., funded by an endowment), engage in best practices and strategic planning, are key members of their community, and are visionary in their approaches to preserving and sharing history.²⁵ These goals can be neatly categorized into Krug and Weinberg’s three-dimensional model for nonprofits, including mission (whether the organization is doing the right things), money (whether it is doing the right things financially), and merit (whether it is doing the right things in terms of quality).²⁶

²⁵Gary N. Smith, “Summerlee Commission on the Financial Sustainability of History Organizations: Summary Findings and Recommendations,” Summerlee Foundation and Dallas Heritage Village, October 2015, 6.

²⁶Kersti Krug and Charles B. Weinberg, “Mission, Money, and Merit: Strategic Decision Making by Nonprofit Managers,” *Nonprofit Management and Leadership* 14, no. 3 (March 2004): 325.

CHAPTER THREE

Methods

Three American science museums were approached and agreed to participate in this case study about the impact of COVID-19 on their organizations. Museum A is a midsize museum located in the South Central region of the U.S. and has operated for over 60 years. Museum B is a midsize science center in the Midwest region of the U.S. and has been operating for 25 years, and Museum C is a small science center located in the South Central region of the U.S. and is under 10 years old. Each science museum is classified as a 501(c)3 nonprofit organization and is not associated with a parent organization capable of providing funding in times of distress. Science museums were chosen because, compared to other types of museums, admissions make up the highest percentage of earned revenue (approximately 49%), so the expected impact of the pandemic on revenue is highest in these museums.¹

In April 2022, the executive directors of each science museum were interviewed via video chat to gather information about their financial and organizational decisions during the COVID-19 pandemic. The interviews lasted between 45 and 75 minutes and extensive notes were taken on the directors' responses. The questions (see Appendix) asked established a basic understanding of how the directors viewed the impact of COVID-19 on their organizations, determined a timeline of each museum's response to

¹Merritt, Katz, and American Association of Museums, *2009 Museum Financial Information* (Washington, DC: American Association of Museums, 2009).

various challenges presented in different stages of the pandemic, and then explored the factors that influenced budgeting and revenue.

In addition to the interviews, several other sources provided necessary background information to form a full picture of the impact of the pandemic on the three science museums. These included each nonprofit's audited financial statements and strategic plans as well as articles about COVID-19 and forms of government aid to gain a more complete understanding of the challenges reported by the directors. Data was gathered into Microsoft Excel and sorted into five categories, allowing for comparison and evaluation.

CHAPTER FOUR

Findings

The aim of this study is to identify the resiliency tactics used by three science museums to adapt to the challenges of the pandemic. The supporting data from the interviews with the three science museum directors is presented in this section. Following the five functional categories (financial, human resources, outreach, programs and services, and management and leadership) given by Searing et al., two or three resiliency tactics emerged in each category. The resulting resiliency tactics are summarized in Table 1.

Table 1. Resiliency tactics implemented by science museums.

Functional Categories	Resiliency Tactics
Financial	Reallocating funds Acquiring new revenue sources
Human Resources	Staffing changes Communicating with staff
Outreach	Collaborating with other museums Connecting with the community Communicating with donors and other external stakeholders
Programs and Services	Creating virtual and kit programming Increasing physical safety precautions
Management and Leadership	Financial planning Long-term strategic planning

Financial

Two tactics emerge in the financial category: reallocating funds and acquiring new revenue sources. Both relate to the organizations' ability to cover their expenses.

Reallocating is the process of moving funds around within the budget, while acquiring new funding sources is external to the budget. Tables 2-4 summarize the financial data discussed in the following paragraphs for Museums A, B, and C.

Table 2. Financial breakdown of Museum A.

	Museum A		
Fiscal Year (FY)	FY 2019	FY 2020	FY 2021
End of FY	30-Jun	30-Jun	30-Jun
Attendance	580,287	353,900	259,633
Total Revenue	\$ 11,039,791	\$ 8,309,061	\$ 17,581,604
Earned Revenues	59%	60%	23%
Revenues from Contributions	14%	28%	13%
Revenues from Investment/Endowments	27%	12%	64%
Value of Endowment	\$ 43,205,484	\$ 42,192,571	\$ 51,437,854
Total Expenses	\$ 10,748,767	\$ 11,645,224	\$ 9,706,511
Staff Salaries as a % of total expenses	49%	34%	39%
Net Income	\$ 291,024	\$ (3,336,163)	\$ 7,875,093

Table 3. Financial breakdown of Museum B.

	Museum B		
Fiscal Year (FY)	FY 2019	FY 2020	FY 2021
End of FY	30-Sep	30-Sep	30-Sep
Attendance	N/A	N/A	114,627
Total Revenue	\$ 7,217,131	\$ 4,723,502	\$ 7,758,466
Earned Revenues	63%	47%	43%
Revenues from Contributions	27%	40%	52%
Revenues from Investment/Endowments	10%	13%	5%
Value of Endowment	\$ 8,066,584	\$ 5,620,187	\$ 6,123,889
Total Expenses	\$ 6,617,728	\$ 5,832,261	\$ 4,966,619
Staff Salaries as a % of total expenses	51%	54%	50%
Net Income	\$ 599,403	\$ (1,108,759)	\$ 2,791,847

Table 4. Financial breakdown of Museum C.

	Museum C		
Fiscal Year (FY)	FY 2019	FY 2020	FY 2021
End of FY	30-Jun	30-Jun	30-Jun
Attendance	53,940	30,403	11,935
Total Revenue	\$ 2,534,186	\$ 3,777,950	\$ 2,498,794
Earned Revenues	73%	33%	45%
Revenues from Contributions	24%	66%	51%
Revenues from Investment/Endowments	3%	1%	5%
Value of Endowment	\$ -	\$ -	\$ -
Total Expenses	\$ 4,770,283	\$ 4,801,905	\$ 4,374,910
Staff Salaries as a % of total expenses	45%	46%	48%
Net Income	\$ (2,236,097)	\$ (1,023,955)	\$ (1,876,116)

While nonprofits may reallocate funds in their everyday operations as needed, this tactic was essential to maintaining the cash flows necessary for operation during the pandemic. One museum shifted money away from their original long-term programming and capital plans into their operational funds. Restricted funding adds another level of complexity to reallocation. Sometimes the restricted funding can be reallocated with the permission of the donor. Museum B successfully navigated this with their donors and shifted funds from capital planning to operational funds. However, other restricted funds tied to deliverables that could not be met during pandemic could not be reallocated and had to be shifted to the budget for another year.

Another reallocation consideration was how the museum's budget was divided between expenses, especially staff salaries. Most organizations rely on historic operations numbers to set the next year's budget, but COVID was a paradigm shift in the field. "Normal operations" became obsolete and no longer represented a reliable baseline for museum budgets in an uncertain future. A survey done by the American Association of Museums in 2009 found that staff salaries account for an average of 45.8% of total expenses for science and technology museums.¹ According to the financial statements of the three museums, staff salaries as a percentage of total expenses operated within 6% of this average. Museum A had the largest decrease in staff salaries as a percentage of total expenses – from 49% in FY 2019 to 34% in FY 2020, while Museums B and C increased minimally. The financial flexibility provided by reallocating funds allowed museums to

¹Merritt, Katz, and American Association of Museums, *2009 Museum Financial Information* (Washington, DC: American Association of Museums, 2009).

meet their most urgent cash flow needs and focus on acquiring new funding sources, which is the next financial resiliency tactic.

While museums acquire funding from a variety of sources, two sources that were commonly mentioned in the interviews were rainy day funds and government-provided loans and grants. In this article, the phrase “acquiring new funding” may refer to the use of funds that were set aside for an emergency (i.e., not used in typical operations) or were given to the museum due to the pandemic. The Tax Policy Center defines state rainy day funds as those that “allow states to set aside surplus revenue for use during unexpected deficits.”² This basic definition is also applicable in the nonprofit and museum context. It is helpful to note that this paper uses the terms “rainy day fund” and “financial slack” interchangeably. Bourgeois defines slack as “the resource that enables an organization both to adjust to gross shifts in the external environment with minimal trauma, and to experiment with new postures in relation to that environment...”³ Extrapolating this definition to financial slack, one concludes that both financial slack and a rainy day fund are surplus financial resources available to cover unexpected expenses. All three of the science museums interviewed had a rainy day fund, although the amount of time this fund could support base operations varied. Museum B’s situation was unique because they had maneuvered into a strong financial position just before the beginning of the pandemic and had only just begun to talk about the details of creating a rainy day fund. The director notes, “It wasn’t that purposeful of a rainy day fund because we had been so

²“What Are State Rainy Day Funds, and How Do They Work?,” Tax Policy Center, accessed April 2, 2023, <https://www.taxpolicycenter.org/briefing-book/what-are-state-rainy-day-funds-and-how-do-they-work>.

³ L. J. Bourgeois, III, “On the Measurement of Organizational Slack,” *The Academy of Management Review* 6, no. 1 (January 1981): 31.

focused on paying off our debt that once that was paid off and we got into showing that, yes, we could... do a little better than breaking even, the goal was... [to] talk about how large of a rainy day fund we wanted.” Because Museum B was in the process of paying off debt and shifting operations, they had cash on hand that served as a makeshift rainy day fund and supported operations for about six months.

Government grants and loans played a substantial role in the viability of museums and many other nonprofits and businesses during the pandemic. The two primary forms of government assistance to museums were the Paycheck Protection Program (PPP) and the Shuttered Venue Operator’s Grant (SVOG). On their website, the U.S. Small Business Administration (SBA) gives a brief explanation of both programs. The PPP loan is “an SBA-backed loan that helps businesses keep their workforce employed during the COVID-19 crisis.”⁴ The program was originally created in March 2020 and has distributed over \$500 billion in loans since its creation.⁵ The \$16 billion SVOG program “provides emergency assistance for eligible performing arts businesses [including all types of museums] affected by COVID-19” and was signed into law in December 2020.⁶

Museum A received a first-round PPP loan of \$986,127 in April 2020 (FY 2020) and a second-round PPP loan of the same amount in January 2021 (FY 2021) for a total of \$1,9472,254. Additionally, Museum A was given a \$1,626,004 SVOG in July 2021

⁴“Paycheck Protection Program,” U.S. Small Business Administration, accessed April 13, 2023, <https://www.sba.gov/funding-programs/loans/covid-19-relief-options/paycheck-protection-program>.

⁵Sean Ludwig, “Paycheck Protection Loans Questions Answered,” U.S. Chamber of Commerce, March 31, 2020, <https://www.uschamber.com/co/co/run/business-financing/commonly-asked-questions-coronavirus-small-business-loans>.

⁶“About SVOG,” U.S. Small Business Administration, accessed April 13, 2023, <https://www.sba.gov/funding-programs/loans/covid-19-relief-options/shuttered-venue-operators-grant/about-svog>.

(FY 2022). As expected, Museum A experienced a net loss of \$3,336,163 in FY 2020, which was marked by three months of closure. It is interesting to note the difference in net income between FY 2019, pre-pandemic operations, and FY 2021, post-closure operations. FY 2019 had a net income of \$291,024, while FY 2021 had a net income of \$7,875,093 – a difference of over \$7.5 million (Table 2). This increase in income is largely due to the PPP loans they received as well as drawing significantly from their endowment. According to Museum A’s director, the money that was originally reallocated from capital budgeting to operations was put back into capital budgeting when the PPP loans came through, allowing the museum to resume long-range planning.

Museum B received \$688,700 in first-round PPP funding in April 2020 (FY 2020) and \$688,077 in second-round PPP loans in February 2021 (FY 2021). They also applied for and received \$289,837 in Employee Retention Credit in FY 2021, as well as a \$1,316,742 SVOG in July 2021 (FY 2021). In FY 2020, after closing for four months, Museum B had a net loss of \$1,108,759. Like Museum A, Museum B experienced a \$2,192,444 increase in their net income from FY 2019 to FY 2021 due to loans and grants (Table 3).

Museum C received a first-round PPP loan of \$498,500 in April 2020 (FY 2020) and a second-round PPP loan of \$498,590 in June 2021 (FY 2021) for a total of \$997,090. Additionally, Museum C was given a \$359,259 bridge grant, an interim financing option intended to cover short-term expenses until long-term financing can be arranged, in FY 2021.⁷ Unlike the other two museums, Museum C experienced operating losses for all three years, averaging \$1,712,056 per year. The effect of the influx of

⁷“Bridge Financing Explained: Definition, Overview, and Example,” Investopedia, accessed April 15, 2023, <https://www.investopedia.com/terms/b/bridgefinancing.asp>.

revenue through loans and grants is still evident in the percentage of earned revenue versus the percentage of revenue from contributions. In FY 2019, 73% of revenue came from earned income (e.g., admissions and memberships, gift shop, café sales), and 24% came from contributions. In FY 2021, 45% of revenue came from earned revenue, and 51% was from contributions (Table 4).

While grants and loans bolstered museum cash flow during the COVID-19 crisis, it is not reasonable to assume that these funds will be available to museums to the same extent during future economic or health crises. With the memory of the pandemic fresh in their minds, museum leaders should carefully consider the needs of their organization and create financial plans that increase operational efficiency and ensure financial reserves during future crises.

Human Resources

During the pandemic, nonprofits reported an increased amount of staff turnover and difficulties filling vacancies. 79% of nonprofits responded to the National Council of Nonprofits' survey reported salary competition as a main factor of the staffing shortage.⁸ Based on the comments of the directors, the staffing shortage was a major concern, and the museums changed their behavior to retain staff as long as possible. Their actions can be sorted into two categories: staffing changes and communicating with staff. Staffing changes refer to not only to staffing gains and losses, but also to changing staff responsibilities. Communicating with staff was also vital to staff cohesion and museum

⁸“Nonprofit Workforce Shortages: A Crisis That Affects Everyone,” National Council of Nonprofits, March 22, 2023, <https://www.councilofnonprofits.org/reports/nonprofit-workforce-shortages-crisis-affects-everyone>.

resilience. The leadership team of each museum ensured that discussions about mental health, finances, and corporate culture and mission were held frequently.

During crisis, museums generally prioritize retaining staff for as long as possible.⁹ As museums tried to operate more efficiently, the desire to continue “investing in the team for as long as possible” and “figuring out ways to redeploy people” was evident. When closures were announced and staff began to work from home, staff responsibilities began to change. Because the normal work of many staff members was no longer possible, employees were directed to assist with other projects inside of the museum. For example, one staff member expressed that they did not like the closing announcements at the museum each night, so they made a calendar with daily and weekly scripts for new and varying closure announcements.

Staff responsibilities also changed as museums made the difficult decision to lay off staff or as staff left voluntarily. Museum B, for example, made high-level staff cuts, and the staff members who were most intimately involved in doing the work were trained to perform the functions of the senior role, rather than bringing in another manager. This shift also allowed Museum B to raise the minimum wage within their organization to \$15 per hour to compensate the staff that spent the most time on site. This positively impacted staff retention rates, which remained high throughout the pandemic. On the other hand, Museum C dealt with increased movement within the museum field as employees left their museum. The director notes several other factors that might have caused high staff turnover, including personal safety concerns, career-boosting opportunities at other museums or nonprofits, and disillusionment with the museum field (particularly in those

⁹Searing, Wiley, and Young, “Resiliency Tactics during Financial Crisis,” 188.

nearing retirement age). While the openings decreased staffing expenses, other team members' responsibilities changed once again to cover unfulfilled roles.

Museum leadership also emphasized the ways in which they continued to communicate with and care for their staff. One way that Museum A cared for their staff was by collaborating with their state museum association and compiling resources for employee wellbeing. These included information on vaccines and masks; anxiety, stress, and burnout; grief and loss; racial trauma; and much more. Museum B focused on increasing financial transparency. While staff at the executive and manager levels were already highly involved in the budgeting process, Museum B distributed their monthly budgets to their staff and invited questions and discussion about the budget through all-staff meetings and break-out sessions. In the interview, the director noted the diversity, equity, accessibility, and inclusion (DEAI) implications of financial transparency among the staff: "It's also a [DEAI] approach... there are institutions where the budget is handed down from the finance leadership... and that causes a lot of inequity in terms of how our funds are spent, where our funds are spent,... who get access to information, [and] who understands the strategy behind the project." Museum B intends to incorporate the practice of transparency into their standard, post-pandemic practices. Museum C emphasized educating their employees on the museum's culture and mission, especially new employees who joined during the pandemic. By communicating staffing changes and allowing staff to be innovative as well as inviting staff into conversations about mental health, financials, and the importance of the organization's culture and mission, the directors made long-lasting organizational changes, increased staff retention, and developed a stronger team.

Outreach

Outreach refers to the cultivation of relationships.¹⁰ The resiliency tactics in this category used by the three science museums concerned three different audiences: other museums and museum associations, donors and other external stakeholders, and the community.

One way that museums prepared for and responded to COVID-19 is by reaching out to other museums, either through associations or individually. Membership in state museum associations and subject-specific associations, such as the Association of Science and Technology Centers (ASTC), allowed museum leadership to learn from the prior experiences of and brainstorm solutions with other museums. This connection to other museums was especially significant when making decisions about when and how to approach closure in March 2020. ASTC is an international association, so its U.S. members had the advantage of learning about the closure process from their European counterparts a month before closures began in the U.S. One challenge specifically mentioned by Museum C was the young age of their science center (under ten years old). Since the organization is young, the senior leaders had less practical experience and smaller networks with other organizations on which to rely. This made quick, often significant decision-making under uncertain conditions even more difficult.

During the pandemic, museums also communicated to and relied on their donors and other external stakeholders. Because individual donors account for 70% of all

¹⁰Searing, Wiley, and Young, “Resiliency Tactics during Financial Crisis,” 188.

charitable giving,¹¹ fostering and maintaining strong relationships with donors is critical for the stability and success of any nonprofit. As mentioned above, these relationships were essential in the reallocation of restricted funding from capital projects to operations. Board members with networks outside of the nonprofit sphere also played a role in resilience. For example, one of the board members of Museum C worked for a large bank and was able to provide early information about loan programs that would supplement museum revenue.

Finally, communication with the community, especially demonstrating the museum's commitment to their mission, was a major component to success in a post-pandemic world. For the three science museums in this study, commitment to mission was demonstrated to the community through their actions. For example, Museum A upheld their mission and vision in three ways. First, they decided, before any mandates or regulations, that they would close their doors in an effort to reduce the spread of COVID-19. The director explains, "As a science museum, we have to be a leader in the field for best practices in science... We [made] the decision to close the doors, and then everybody else followed closed quickly." Second, they refunded memberships. This significantly impacted revenues, but maintaining the trust of their members and the community took priority. Third, when the capital budget was restored after the PPP loans, Museum A reaffirmed their intentions to build a planetarium to "continue investing in ourselves so that we can demonstrate benefit to our community... and continue our community outreach." By moving forward with the planned capital projects, Museum A reminded its

¹¹"Giving USA 2018: Americans Gave \$410.02 Billion to Charity in 2017, Crossing the \$400 Billion Mark for the First Time," Giving USA, June 13, 2018, <https://givingusa.org/giving-usa-2018-americans-gave-410-02-billion-to-charity-in-2017-crossing-the-400-billion-mark-for-the-first-time/>.

local community that it is a valuable resource and committed to making improvements that benefit everyone. By building trust and taking steps to clearly define the museum's impact, the museum demonstrates their value to the community, and in return, the community continues to attend (allowing the museum to continue their mission) and to donate to ensure the museum's survival. By connecting with other museums, external stakeholders, and the community, the three museums positioned themselves for success before, during, and after the pandemic.

Programs and Services

Due to widespread closures in March 2020, museums had to reimagine their typical programs and services, resulting in the creation of new types of programming. Even when museums began to reopen again, a desire to keep visitors safe and uncertainty about the nature of the virus caused museums to take additional (and often costly) physical safety measures.

While some museums had already established virtual programming before the pandemic, most had not. During the three to four months that museums were closed, virtual and kit-based programming became the central methods for museums to offer their services to the community. These included programs such as online Boy Scout camps and virtual programming to supplement formal education. Museum A did not charge for their virtual programming, which reduced programming revenue. However, they did receive some grants to create virtual content. When restrictions became lighter, Museum B offered space in their building for students to take their virtual classes.

The physical safety of both visitors and museum staff was another concern that the three science museums addressed when they reopened to the public. Because science

museums educate primarily through hands-on learning, uncertainty of how COVID-19 spread caused many museums to rethink their sanitation policies. For example, Museum A not only increased the sanitation of high-touch areas, but they also updated their air handling and purification system to better ensure the safety of everyone in the museum. Programming shifted organically as COVID-19 restrictions phased in and out. The museum staff was passionate and diligent about providing programming to their respective communities, and each museum addressed physical sanitation issues with care.

Management and Leadership

The management and leadership category examines the actions of each museum's leadership team in response to the pandemic. For many, the pandemic demonstrated previously unrecognized organizational weaknesses, but it also brought an opportunity to make constructive changes. The adage "Don't waste a good crisis." rings true in these circumstances. Each of the directors emphasized the importance of adapting their organization and creating a new plan to prepare for a similar crisis in the future. They agreed on a two-part plan, which balances careful financial planning and long-term strategic planning.

In this instance, financial planning refers to creating both operational efficiency and financial reserves for future crises. Museum B provides one example of taking advantage of the crisis and striving for operational efficiency by implementing some operational changes that the board had previously considered radical such as downsizing high-level staff and ensuring all staff were paid a minimum of \$15 per hour. Museums A and C also mentioned rebuilding their rainy day funds with the former planning to accumulate two years of basic operating funds.

Good financial planning alone, however, does not make a healthy museum. It must be balanced with a long-term strategic plan that encompasses the organization's mission and vision. If either strong finances or a clear mission is missing, a museum has no hope of thriving. Maintaining the appropriate balance between the two is difficult under regular conditions, so having a firm plan that considers both financial and long-term organizational goals before times of crisis is paramount. The directors of the case study museums each recognized this balance. After sorting out the financial stability of their museums, they immediately doubled down on the execution of their strategic plans, particularly the capital plans. As mentioned above, Museum A continues to work toward the completion of the planetarium in the next two and a half years, and Museum C remains committed to its own five-year capital plan.

CHAPTER FIVE

Conclusion and Recommendations

Like any organization in a similar situation, a museum's response to a disruptive event, especially one like COVID-19 with such broad economic and social impacts, is complex. Literature connecting organizational resilience to nonprofits exists, but such studies tend to focus on healthcare nonprofits. This study expands on previous literature and identifies the resiliency tactics applied by three science museums to successfully adapt to the challenges presented by COVID-19.

In addition to theoretical implications, the identified resiliency tactics lead to three practical recommendations. First, as mentioned in the quote by Nik Honeysett, we should expect that another disruptive event will happen in the future, and because of this, museums need plans that ensure resilience. This requires a balance between strong financial planning and a clear, mission-driven strategic plan. Lindqvist explains the balance well: "For museums, taking a stakeholder perspective means not only developing a well-thought-out strategy to balance costs with revenue, but also developing a fuller understanding of the wider context of the organization."¹ The financial plan focuses on creating and maintaining operational efficiency and financial reserves, whereas the strategic plan functions to develop and execute goals that advance the museum's mission. Together, these plans improve a museum's resilience through both quantitative and qualitative methods.

¹Lindqvist, "Museum Finances," 6.

Second, nurturing a cohesive team through strong communication and transparent conversations is critical. The rapid staffing turnover in the museum field during and after the pandemic was mentioned by a couple of the directors, and concerns about retaining current staff and training new staff were substantial. In the end, leadership decided one of the best ways to combat this turnover was to communicate with staff well. This included not only communicating changes in policy or responsibility but also remaining open to staff suggestions concerning museum improvement. Additionally, leadership held more transparent discussions about mental health, finances, and organizational culture. These behavioral changes allowed them to form a stronger team and a more resilient museum.

The third practical takeaway is that outreach should not only include the community and donors but also other museums. Forming strong relationships with other museums, either between individual institutions or through an association, allows museums to make more informed and timely decisions based on the collective wisdom and practical experience of other museum professionals. Collaboration is highlighted as a highly influential resiliency tactic in current literature but does not consider collaboration between similar organizations.² While other organizations, particularly for-profits, tend to keep operating procedures and financial details to themselves, museums are often more open to disclosing these types of details. This is because museums in the same content bracket are mostly regional attractions and are generally not in competition with each other for audiences and funding. This is also bolstered by the natural spirit of learning that is cultivated in the museum field. It is important to note that most of the relationships with other museums mentioned by the directors were established prior to the pandemic.

²Stötzer et al., “Coping with COVID-19,” 526.

In fact, the ability to form new relationships decreased significantly with the onset of the pandemic. Thus, museums that formed these relationships before the pandemic had a larger network to rely on and gain resiliency tactics from compared to younger museums that lacked these well-established relationships. This is seen in Museum C's difficulties as a young organization since they were unable to draw on staff experience or knowledge from collaborative networks.

There are several limitations to this study. First, this is a small case study, and while the resiliency tactics identified here seem to correspond with other research, it is hard to draw generalizations. Second, the timeline of this study was short, and it will take time to see if the directors' plans for future financial stability and capital planning are effective. Third, as Dayson et al. mention, the interview approach is helpful for understanding a museum's response to a disruptive event, but it does not reveal why such responses are effective. Further quantitative research is necessary to establish how certain actions result in organizational resilience.

This paper identifies the resiliency tactics applied by three science museums to successfully adapt to the challenges presented by the COVID-19 pandemic. In many ways, the responses of the three science museums reflect previous conclusions of studies examining nonprofit organizational resilience. These tactics include exercising careful financial and strategic planning, developing strong teams through transparency, and embracing innovation and collaboration. The findings of this study also suggest that museums are unique in their responses to disruptive events. Compared to other nonprofits, museums generate revenue through different means. While donations are still significant, many museums in the U.S. do not typically have substantial government

funding, and admissions fees contribute substantially to revenue. Museum networks are also uniquely collaborative, and this collaboration allows them to be more resilient. Creating organizational resilience is a complex process that we still do not fully understand. Each element of a museum's organizational structure works in tandem to ensure success during times of crisis. It is not enough to think about organizational resilience as purely a financial problem. Financial health, human resources practices, community outreach, programs and services, and management and leadership systemically work together to create a more resilient organization.

APPENDIX

APPENDIX

Interview Questions

1. Did COVID change how you think about museums? If so, how?
2. How did your organization initially respond to COVID? What about during COVID (i.e., after PPP and SVOG were announced)? How are you planning for the future now?
3. How has your budgeting changed from pre-COVID to now? How are you planning to budget coming out of the pandemic?
4. How have your main sources of revenue been affected by COVID? (This could include fundraising, local/tourism visitation, school programming, endowment, etc.)
5. Financials aside, what are your top three goals/priorities as a director?

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