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Using Measures of Impact
and Benefit to Inform
Decision Making at
**The Virginia Museum
of Natural History**

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USING MEASURES OF IMPACT AND BENEFIT TO INFORM DECISION MAKING AT THE VIRGINIA MUSEUM OF NATURAL HISTORY

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Lynsey and Sammy



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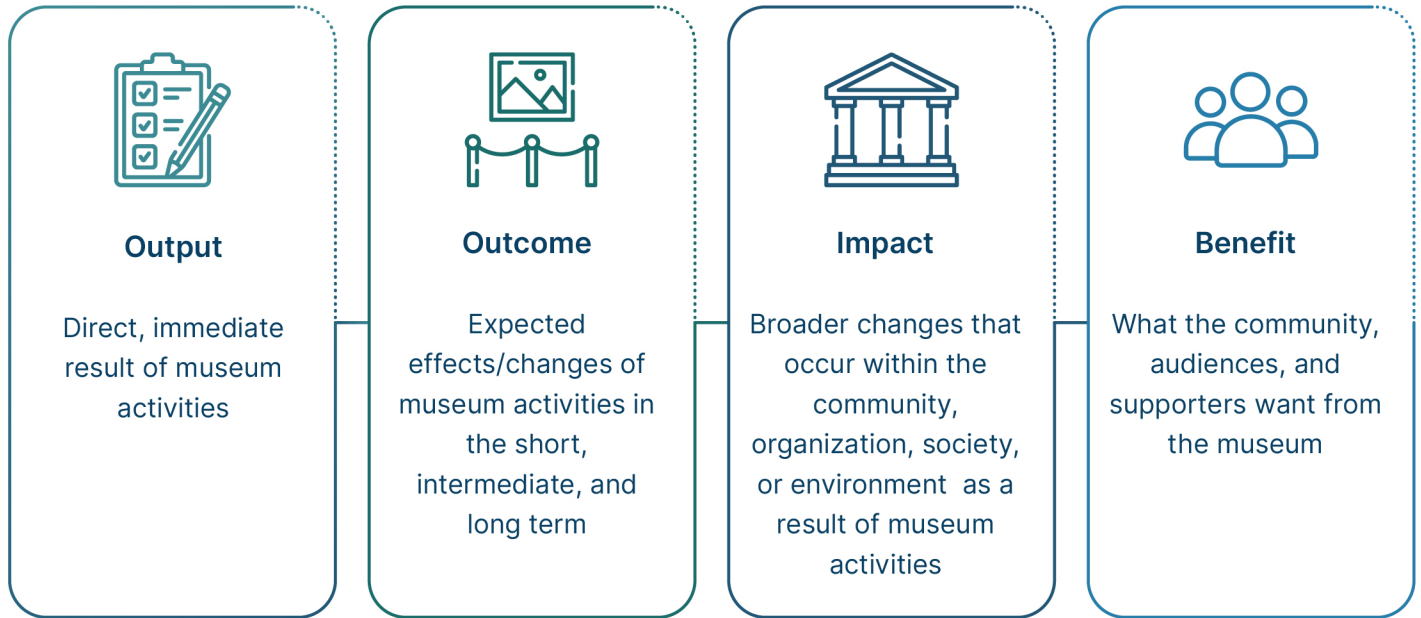
Executive Summary

The Virginia Museum of Natural History (VMNH) is an agency of the Commonwealth of Virginia. Located in Martinsville, a small town in Southern Virginia, VMNH is the state's official museum of natural history with a mission to "interpret Virginia's natural heritage within a global context in ways that are relevant to all citizens of the Commonwealth." VMNH is a comprehensive museum, consisting of research and collections, exhibits, and education functions. VMNH is a Smithsonian Affiliate and is accredited by the American Alliance of Museums (AAM), a distinction held by fewer than 5% of the nation's museums.

DEFINITIONS

For the purposes of this study, we define four key terms as follows. Outputs are the direct, immediate results of museum activities. Outcomes are the expected effects/changes of museum activities in the short, intermediate, and long term. Impact is the broader changes that occur within the community, organization, society, or environment as a result of museum activities. Benefit is what the community, audiences, and supporters want from the museum.

FIGURE 1



PROBLEM OF PRACTICE

The museum's budget hampers the ability to fund some essential functions and recruit and retain staff members in key roles. As a result, VMNH leaders have not allocated substantial resources to comprehensive program evaluation. The museum does not have a dedicated institutional effectiveness officer. Program evaluation is done by individual staff or departments on an as-needed basis, typically for compliance with the requirements of funders. The executive director acknowledged that there are opportunities to better use data. He asked us for help in determining how VMNH leaders can best leverage the museum's resources to assess and use data to increase impact and stakeholder benefit.

BACKGROUND

Museum leaders have historically resisted performing the types of evaluations that others in the arts and non-profit sectors have adopted because leaders often view museum impacts as challenging to define (Poll, 2018). Worts (2006) argues that leaders have frequently made the claim that museum impact is difficult to define because museum professionals seek to influence and

benefit both individuals and communities culturally, educationally, and in other less tangible ways. Museum leaders often argue that it is important not to be limited or pigeonholed by compliance-based evaluations (MacPherson et al., 2019). To counter these prevailing attitudes, Preskill (2011) advocates for clearly defined evaluation frameworks that can lead to deeper connections between a museum's aspirations and subsequent evaluations. This claim that museum impact is challenging to articulate has led many museum professionals to focus on outputs and outcomes instead of impact. However, as Whitesell (2016) asserts, this prevalent tendency to focus on outputs and outcomes rather than impact may be short-sighted. A single museum may have both short- and long-term outcomes as well as near- and far-reaching impacts.

Research Questions

Our research questions were as follows.

- ➔ How do the museum's governing boards and executive leadership currently define impact?
- ➔ How does the museum's executive leadership use data to inform decision making?
- ➔ What do the museum's community, audience, and supporters identify as opportunities for increased benefit?

FINDINGS

Our findings are as follows.

- ➔ Interview responses indicate that the museum's governing boards and executive leadership understand the dimensions of museum impact that could be used as metrics to inform decision making. However, when discussing impact, interviewees often supported claims with anecdotes and output data.
- ➔ The museum's executive leadership has access to metrics on attendance, revenue figures, broad engagement measurements, and visitor feedback, but the data is not used consistently to inform decisions.
- ➔ One of the museum's intentional purposes as prescribed by the Code of Virginia is "to encourage individuals and scholars to study our natural history and to apply this understanding of the past to the challenge of the future." However, museum stakeholders

report that exhibits and events do not consistently inspire them to apply learning to make decisions or change behavior.

RECOMMENDATIONS

Our recommendations are as follows.

- Create an organizational planning and evaluation framework based on the Museum Theory of Action (Jacobsen, 2016). By using a consistent planning and evaluation framework, VMNH leaders can gain a comprehensive perspective on the museum's overall performance, deliver programs and activities with increased fidelity, and generate actionable insights. A framework based on the Museum Theory of Action will help VMNH leaders achieve three objectives: documentation of current program results in comparison to intentions, planning and decision making for the future, and a shared language of evaluation across all programming. These insights can serve as a foundation for building a culture of impact-driven continuous improvement at the museum.
- Develop Key Performance Indicators (KPIs) aligned with the museum's intentional purposes to measure impact and progress toward strategic goals. A strategic determination of KPIs as they align to the museum's intentional purposes can support a holistic understanding of the museum's performance while remaining manageable without dedicated evaluation staff. KPI development at VMNH might start with a brainstorm of possibilities that includes a large audience to identify what metrics are feasible to collect, important to measure, and explicitly aligned to purposes and intended impacts. The KPIs should be specific to VMNH and its context and observable with potential to understand growth or change over time.
- Incorporate opportunities into exhibits and events for visitors to take action. Bringing this recommendation to life could look like partnering with or sponsoring large-scale volunteer opportunities in the region that help participants make connections to the science and research of the initiative. For example, VMNH could partner with the Martinsville Community Development office to offer public programming in conjunction with the Community Resilience Initiative to prepare the community to be a "climate-ready" city in the face of natural disasters. The city is already making strides toward meeting various building and infrastructure benchmarks, and working in conjunction with the museum could unify residents and museumgoers toward a common cause rooted in scientific research.

A family of four is captured in a moment of joy, taking a selfie together. The father, wearing a white long-sleeved shirt and blue jeans, is crouching on the right, holding a smartphone to take the picture. The mother, in a dark top and patterned scarf, stands behind the children. A young boy in a blue shirt and a young girl in a floral patterned top are both smiling at the camera. They are in a museum setting, with a large, dark, textured sculpture of a mammoth or dinosaur in the background. The lighting is dramatic, with strong highlights and deep shadows.

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What we do with the data we could probably improve. It's stored, but it's not necessarily used for anything specific other than adding to our overall picture of where we're at.



Introduction

The Virginia Museum of Natural History (VMNH) is an agency of the Commonwealth of Virginia. VMNH is the state's official museum of natural history with a mission to "interpret Virginia's natural heritage within a global context in ways that are relevant to all citizens of the Commonwealth" (Commonwealth of Virginia, n.d.).

VMNH has an insufficient impact evaluation capability, lacking capacity to collect, manage, and analyze impact data. Currently, evaluation is focused primarily on outputs and outcomes, not impact. In addition, museum leaders do not routinely take account of stakeholder benefit in designing programming and evaluation plans. As a result, the VMNH Board of Trustees and executive leadership do not consistently allocate resources based on alignment of purpose, impact, and stakeholder benefit.

In this paper, we will explore how VMNH leaders define impact, discuss how leadership uses data to inform decision making, and what museum stakeholders identify as opportunities for increased benefit. Findings from this project will be useful in helping the VMNH Board of Trustees and executive leadership determine ways to better collect and make use of impact data and will offer the museum an evaluation framework and strategy for aligning purpose, impact, and stakeholder benefit.



Organizational Context

VMNH was established in 1984 as a private foundation and created as a state agency in 1988. The museum is located in Martinsville, a small city in Southern Virginia. The Martinsville region is economically distressed, has a declining population, and is located at a considerable distance from the state's major metropolitan areas. VMNH is a three-hour drive to Richmond, capital and home to Virginia's most prominent cultural resources, and a five-hour drive to Northern Virginia, the state's wealthiest and most populous region (Hutterer & George, 2010).

To expand the museum's reach, the VMNH Board has plans to establish a branch campus in Waynesboro, which is located closer to the state's population centers and is easily accessible to the hundreds of thousands of tourists who pass through the area during visits to the Blue Ridge Parkway and Shenandoah National Park. In May 2021, the Virginia General Assembly authorized appropriated funding for a detailed design of the project, which is anticipated to take 18 months (Todd, 2021).

Notwithstanding its relatively remote location, VMNH is a comprehensive museum, consisting of research and collections, exhibits, and education functions. VMNH is a Smithsonian Affiliate and is accredited by the American Alliance of Museums (AAM), a distinction held by fewer than 5% of the nation's museums (American Alliance of Museums, 2021). In 2007, the museum moved from its original home in a converted 1920s era elementary school to a state-of-the-art purpose-built facility.

Attendance at VMNH is relatively low for a museum of its stature. The museum attracted approximately 42,000 visitors in FY2019 (Commonwealth of Virginia, n.d.). Earned revenue and private giving are also low, requiring VMNH to rely primarily on its state appropriation. The museum's state appropriation comprises 87% of its revenue (Commonwealth of Virginia, n.d.). This compares to the typical museum which derives, on average, 27% of its revenue from government funds (Bell, 2016). Relatively low attendance results in a budget that is perpetually strained, and the over reliance on government funds leaves the museum at significant risk when state budgets are cut or political priorities shift.

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Problem of Practice

The museum's budget hampers the ability to fund some essential functions and recruit and retain staff members in key roles. As a result, VMNH leaders have not allocated substantial resources to comprehensive program evaluation. The museum does not have a dedicated institutional effectiveness officer. Program evaluation is done by individual staff or departments on an as-needed basis, typically for compliance with the requirements of funders.

When we asked the executive director to articulate the museum's value, he provided us with a list of museum activities, not the impact of those activities. During a subsequent debrief, the executive director acknowledged that there are opportunities to better assess and use data to increase impact and stakeholder benefit.

As part of the museum's 2020-2025 strategic planning work, the Board conducted an analysis of its seven areas of growth using a framework articulated in the book *Engine of Impact* (Meehan, 2019). The Engine of Impact framework, "shows how nonprofits can apply the principles of strategic leadership to attract greater financial support and leverage that funding to maximum effect" (Meehan, 2019). According to the executive director, "our culture is well-rooted in the concept

of 'so what' being economics" He elaborated, " Maybe it's because we were in a (financial) hole 10 years ago." This implies that the museum's limited capacity for evaluation is directed toward determining economic impact.

The long-awaited Waynesboro campus will likely increase attendance and other earned revenue and expand the base of individual and corporate giving to include wealthier and more populous regions of the state. As the museum scales and seeks funding beyond its original home, its newly acquired stakeholders will likely demand a clear accounting of impact. As a result, the VMNH Board and executive leadership hopes to be prepared with a robust evaluation framework. They will need to be able to articulate not only the museum's function but also its impact.

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We learn things and it changes our understanding of the past, and I think that's an important thing to be able to help to tell the visitors... Right now, we have the challenge of biodiversity and the loss of biodiversity. And we're trying to tell the story about why we're concerned there. That's what's important and it comes out of researching the collection.





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Literature Review

During our review of relevant literature, we focused on two consistent themes in museum-oriented research. The first area of focus is museum measurement, specifically the differentiation between outputs, outcomes, and impact. The second area of focus is museum evaluation, with attention to current and emerging evaluation frameworks.

For this study, we adopt the Outcomes Hierarchy measurement framework developed by Butler, Koke, and Wells (2013), which will be examined in more depth in the conceptual framework section of this paper. Our intention in adopting the Outcomes Hierarchy definition is to differentiate impact from outputs and outcomes. Such a distinction is imperative because museums tend to employ an output-based approach to measuring impact (Burton & Griffin, 2008). Burrton and Griffin (2008) note that “much of the work exploring social impact on participation in the arts and the museum sector has been... distorted, often with outcomes serving as evidence of social impact.”

Wells and Butler (n.d.) define impact as “the total consequence of a program, including both intended and unintended (positive or negative) results.” Worts (2006) argues that leaders have frequently made the claim that museum impact is difficult to define because museum professionals seek to influence and benefit both individuals and communities culturally, educationally, and in other

less tangible ways. Museums can, at once, aim to be informational, entertaining, safe, calming, stimulating, engaging, and escapist, which arguably makes their impact difficult to quantify or define (Worts, 2006).

Museum leaders have historically resisted performing the types of evaluations that others in the arts and non-profit sectors have adopted because stakeholders view museum impacts as challenging to define (Poll, 2018). Museum leaders often argue that it is important not to be limited or pigeonholed by compliance-based evaluations (MacPherson, Hammerness, & Gupta, 2019). To counter these prevailing attitudes, Preskill (2011) advocates for clearly defined evaluation frameworks that can lead to deeper connections between a museums' aspirations and subsequent evaluations.

The well-documented claim that museum impact is impossible to articulate has led many museum professionals to focus on outputs and outcomes instead of impact. However, as Whitsell (2016) asserts, this prevalent tendency to focus on outputs and outcomes rather than impact may be short-sighted. A single museum may have both short- and long-term impacts as well as near- and far-reaching impacts. Whitsell (2016) used the case study of a student field trip to illustrate direct causal impacts on a field trip participant. Burton and Griffin (2008) identify examples of direct impact such as community members inspired to volunteer and correlational impacts such as increasing community pride or sparking curiosity that inspires further research into a topic.

Burton and Griffin (2008) take up the phenomenon of how museums can help build social capital in their communities. To support their claim that museums can be engines of social capital building, these authors explore how small museums help build social capital in communities. Using a case study method, Burton and Griffin (2008) developed a framework to guide empirical research on the topic, examining museum benefits through the lenses of "bonding" social benefits, i.e. bringing people together, and "bridging" cultural benefits, i.e. building connections to the community.

Worts (2006), in collaboration with the Working Group on Museums and Sustainable Communities, developed a framework to examine the relationships between museums and the communities they target. Worts's tool uses the lenses of individual impact, community impact, and museum impact to assess the cultural influence of museum programs and strategies (Worts, 2006). Worts identifies indicators for each of the lenses and articulates how these indicators can be used

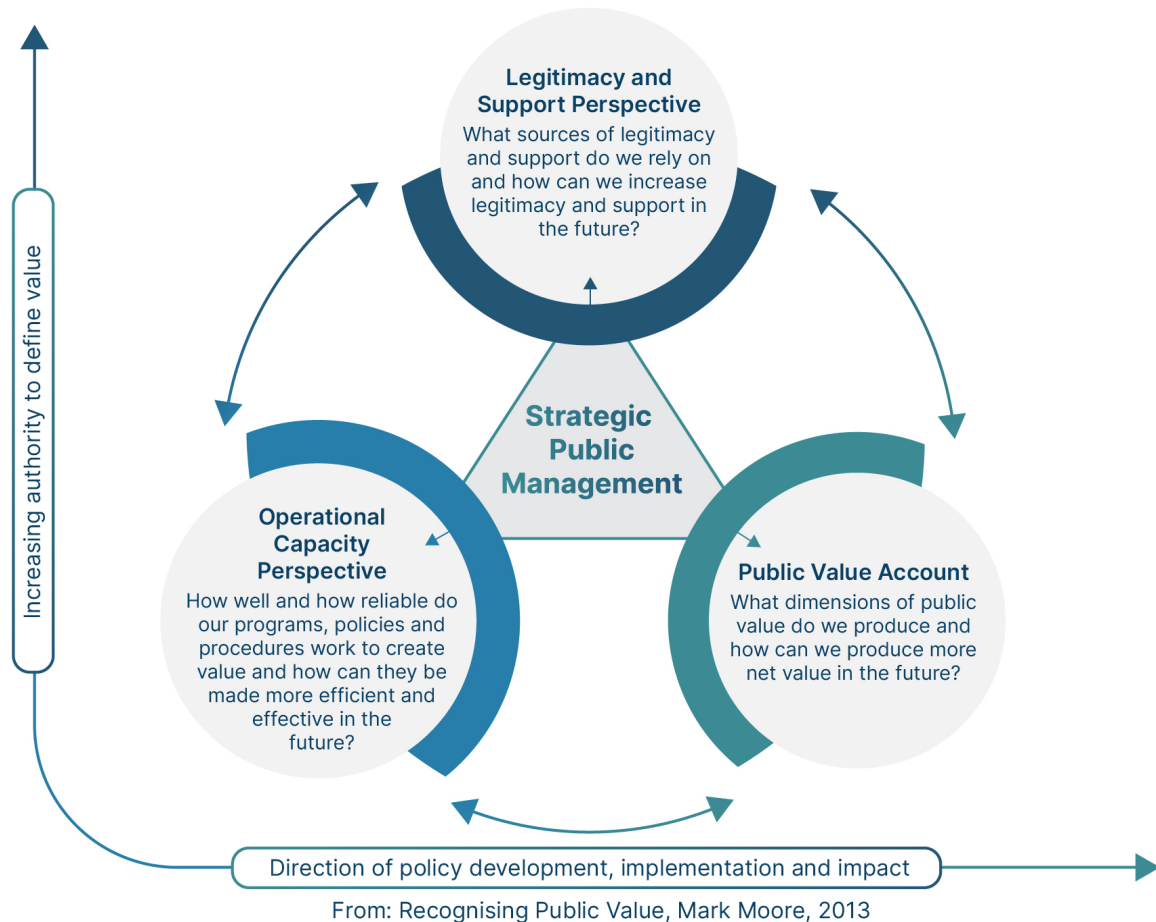
to create measurable outcomes and impacts. He asserts that two factors make an indicator significant. The indicator must be observable, and the measured value must be clearly moving toward or away from the desired goals.

Anderson, Storcksdieck, and Spock (2007) examine museum impact outside of traditional metrics of success, which have typically been immediate and focused on outputs and outcomes. Instead, they advocate for long-term impact analysis (2007). They posit that “Long-term impact studies may not only provide the field with a more complete understanding of the benefits visitors derive from museum experiences, they may also help the museum field better understand the true value of museums for the communities they serve” (Anderson, Storcksdieck & Spock, 2007). Researchers have, in recent years, developed frameworks to provide leaders with tools to assess and communicate value beyond the four walls of the museum. Museum professionals are using these emerging evaluation frameworks to drive iteration and improvement beyond traditional metrics of success.

Carol Scott has been a voice for the urgency of museum impact evaluation. She argues that impact evaluation augmented by assessment of stakeholder benefit yields a richer evaluation framework that articulates the contribution of museums to the “public good” (Scott, 2017). Scott advocates for aligning museum impact frameworks and Public Value Theory. Public Value Theory amplifies evaluation of public sector programs and activities by situating them within the dimensions of politics, efficiency, and stakeholder benefit (Bennington & Moore, 2011).

FIGURE 2

Public Value Theory (Bennington & Moore, 2011)



Scott (2017) asserts that while museums may realize benefits from layering impact evaluation with Public Value Theory, there are challenges. A primary differentiator of Public Value Theory is that it situates museum practice within a political context. Adopting a Public Value orientation requires that museum leaders not only solicit input but also create greater opportunities for democracy in museums decision-making (Scott, 2010). The ability to articulate a museum’s Public Value is derived from a simultaneous focus on gathering feedback while assessing and communicating impact.



Conceptual Framework

The conceptual framework for this study relies on the Outcomes Hierarchy as adapted from Butler, Koke, and Wells (2013) and the Museum Theory of Action as adapted from Jacobsen (2016). Together, these frameworks help us to (a) situate museum impact within a hierarchy of outputs and outcomes and (b) propose a theory of change that encompasses the multiple dimensions that contribute to museum impact.

OUTCOMES HIERARCHY

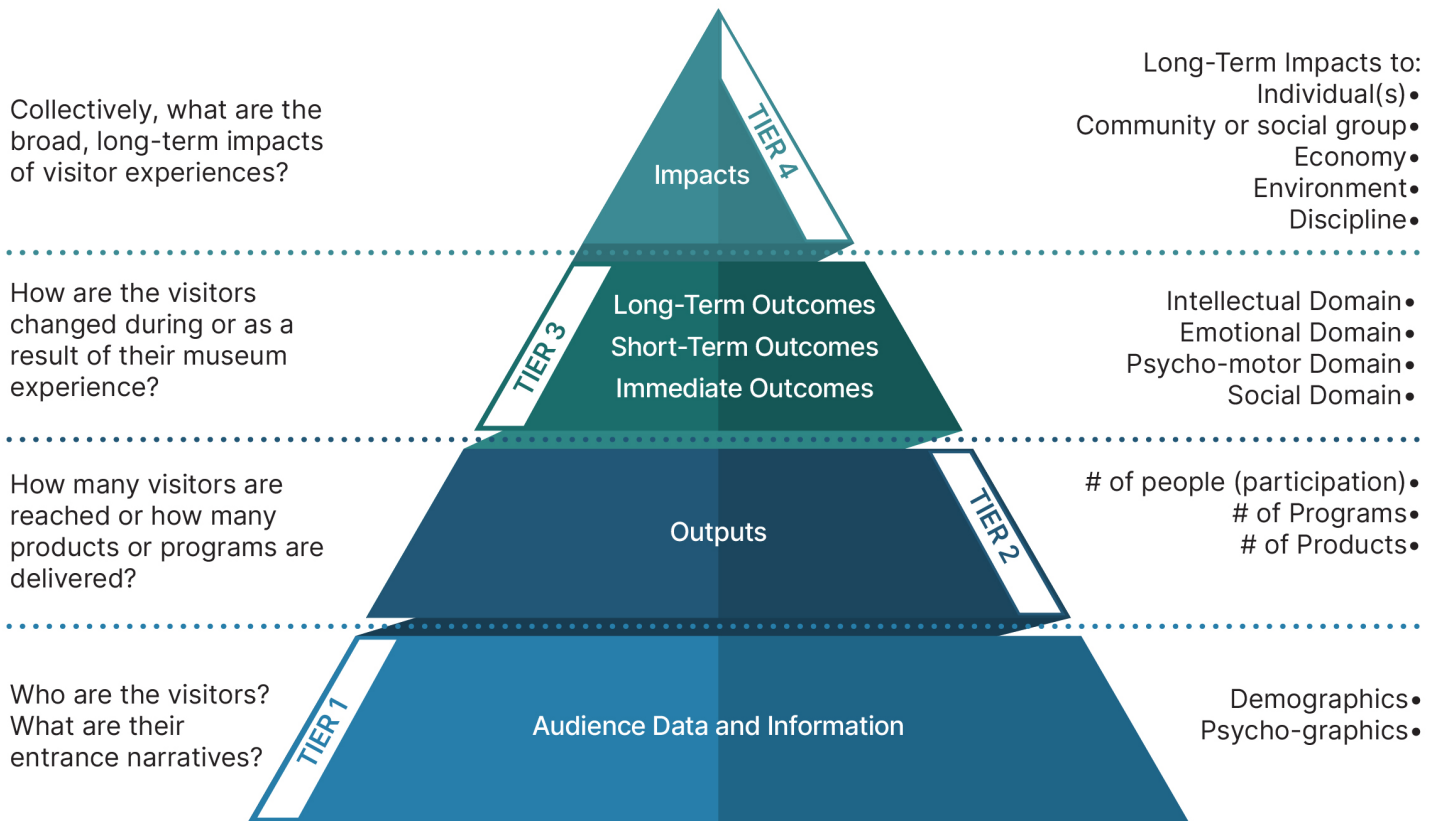
The Outcomes Hierarchy uses a tiered pyramid to visualize the continuum from baseline audience data (Tier 1) to long-term impacts (Tier 4) with outputs (Tier 2) and outcomes (Tier 3) in between (see Figure 4 below). The pyramid is accompanied by guiding questions and suggested variables to measure for each tier. The Outcomes Hierarchy allows us to distinguish between impact and contributors to impact and clarifies the difference between outputs and outcomes. This supports our investigation by providing a tool that we can use collaboratively with museum leadership, grounding us in a shared understanding of definitions, variables, and relationships.

FIGURE 3

Outcomes Hierarchy (Butler, Koke, and Wells, 2013)

GUIDING QUESTIONS

WHAT ARE WE STUDYING?

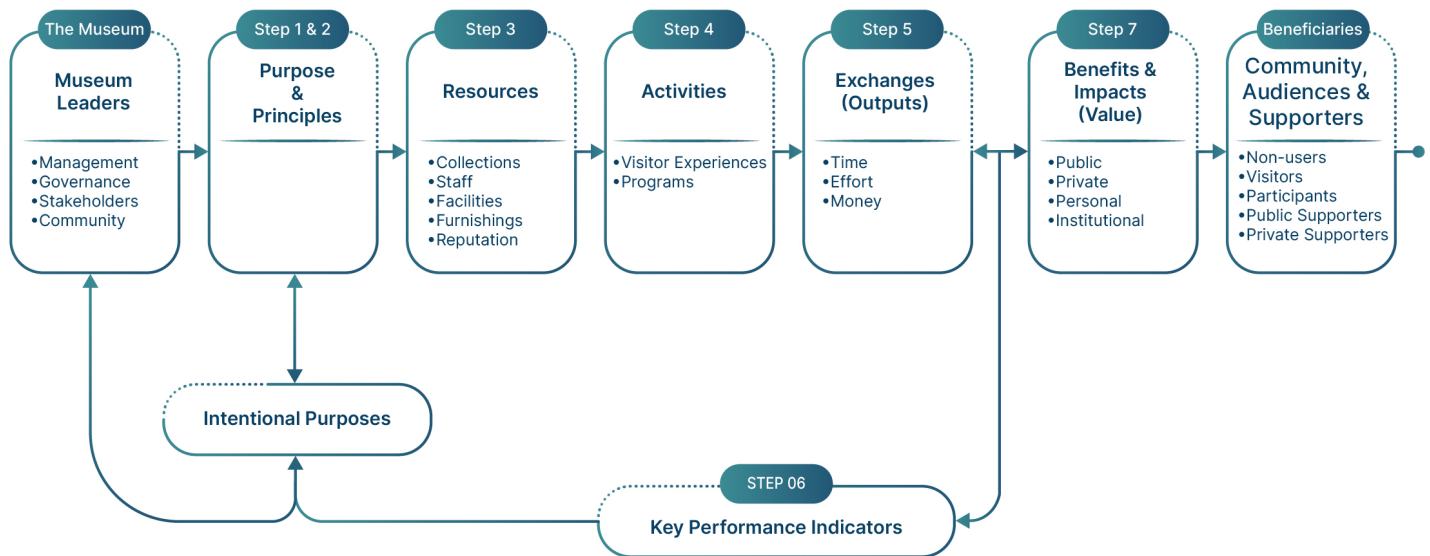


MUSEUM THEORY OF ACTION

Developed by Jacobsen (2016), the Museum Theory of Action is an evaluation framework that provides museum leaders with a means of visualizing the impact of museum activities and a tool for improving a museum’s efficiency and effectiveness in achieving its intentional purposes. According to Jacobsen (2016), the community’s needs should (a) drive the museum’s intentional purposes (b) and the museum, in alignment with its guiding principles, uses its resources to deliver programs and activities that respond to the community’s needs. These (c) programs and activities generate operating and evaluation data which, (d) if programs and activities are effective, demonstrate outcomes, impacts, and stakeholder benefits. The (e) sequence is a continuous loop as the results of programs and activities are used to inform future iteration that presumably increase impact. Essential to the theory is that (f) museum leaders create Key Performance Indicators (KPIs) to evaluate the efficiency and effectiveness of the cycle.

FIGURE 4

Museum Theory of Action Logic Model (Jacobsen, 2016)





Research Questions

Considering our analysis of the problem of practice and its context, review of relevant literature, and development of a conceptual framework, we designed three research questions to guide the investigation.

1. How do the museum's governing boards and executive leadership currently define impact?
2. How does the museum's executive leadership use data to inform decision making?
3. What do the museum's community, audience, and supporters identify as opportunities for increased benefit?

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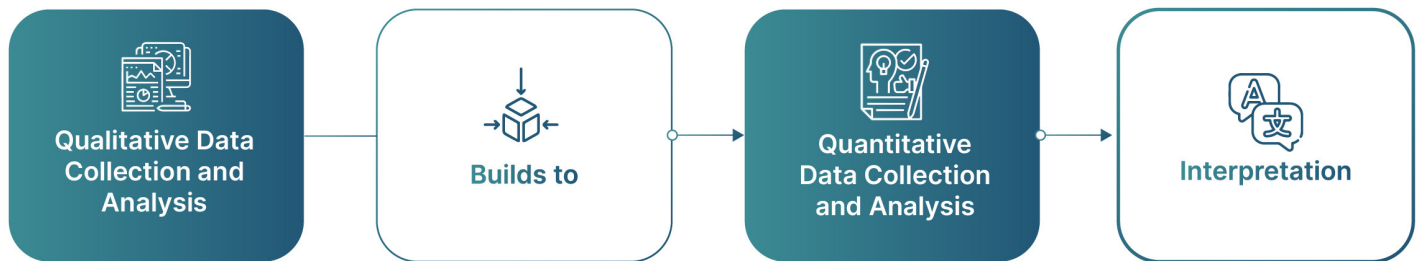


Project Design

For this study, we used a sequential exploratory mixed methods approach (Creswell & Creswell, 2018). This approach allowed us to combine several data collection and analysis methodologies to address the three research questions. The design of this study was predicated on the idea of collecting data sequentially from samples of three research populations: first the museum leadership (Leadership), then board leadership (Boards), and finally museum stakeholders (Stakeholders). We conducted semi-structured interviews to collect qualitative data from samples of Boards and Leadership. This data informed creation of questions for a close-ended survey of the Stakeholders sample. Samples of the Boards and Leadership participated in semi-structured interviews in February and March of 2021, and Stakeholders completed a survey in March 2021. Figure 6: *Sequential Exploratory Mixed Methods Design* below visualizes the sequential exploratory mixed methods design. During the analysis phase, we integrated data from the three samples to produce a more holistic view of the phenomenon and provide insight to support our findings and recommendations.

FIGURE 5

Sequential Exploratory Mixed Methods Design (Creswell & Creswell, 2018)



DATA COLLECTION

For this project, our three data collection methods aligned with our research questions. Figure 7: *Data Collection Table* outlines the relationship between our research questions, data needed, and data collection methods.

FIGURE 6

Data Collection Table

RESEARCH QUESTION	DATA NEEDED	COLLECTION METHOD
1. How do the museum’s governing boards and executive leadership currently define impact?	Boards and Leadership explanations of their priorities as they relate to museum impact	Semi-structured interviews with Boards and Leadership
2. How does the museum’s executive leadership use data to inform decision making?	Leadership explanation of measuring impact across various audiences	Semi-structured interviews with Leadership
3. What do the museum’s community, audience, and supporters identify as opportunities for increased benefit?	Indicators of Stakeholders perceptions of benefit	Survey of Stakeholders sample using a quantitative framework to assess museum stakeholders’ perceptions of benefit at the individual and community level

PARTICIPANTS

Research participants were drawn from samples of three populations: Boards, Leadership, and Stakeholders. For the purposes of this study, we defined *Boards* as the governing boards of VMNH and the VMNH Foundation. We defined *Leadership* as the museum's executive leadership team. We defined *Stakeholders* as the museum's community, audience, and supporters. We used non-probability strategies to create samples for each population.

For Boards and Leadership, we created a purposive sample (Lavrakas, 2008). The sampling criteria were the same for both populations: (1) participants should be recognized as leaders of their constituency, (2) individuals chosen should have broad discretionary power, and (3) participants should have significant tenure in their respective roles. We also got input from the museum's executive director regarding which stakeholders met the sampling criteria to focus our outreach. The participants we chose for the Boards sample were the chair of the VMNH Board of Trustees and the president of the VMNH Foundation. For the Leadership sample, we chose the museum's executive director and deputy director. Given their roles and their relatively long tenures, we determined that these samples would likely be the richest source of data. Given the time intensive nature of gathering and analyzing qualitative data, we deemed two participants an appropriate sample size for each of these populations. The language that was used to introduce this project and request participation can be found in Appendix C: *Recruitment Language for Boards and Leadership*.

We used a voluntary response strategy to create a sample of Stakeholders. To do so, we recruited participants using an electronic mailing list provided by the museum's deputy director. The list comprised 532 names and email addresses and included current and former members, state and local government officials, and community leaders. While not statistically representative, the mailing list provided us with a relatively large group of individuals who presumably had points of view about museum impact and benefit.

All members of the mailing list were emailed a link to a survey that required them first to consent to participate. As an incentive, we offered to donate \$1 to the museum for every response we received. Of those who received the email, 181 (34%) opened the email and 62 (11%) clicked on the link. The final Stakeholders sample consisted of the 61 recipients (11%) The language we used to introduce this survey to members of the mailing list can be found in Appendix D: *Survey Recruitment Language*.

DATA ANALYSIS

We interviewed Boards and Leadership prior to surveying Stakeholders to gain a broad understanding of how VMNH leaders define and evaluate impact. This sequential approach allowed us to explore our research questions at a high level and use the qualitative data collected to identify and operationalize indicators of impact that we used to inform creation of prompts for the quantitative survey.

To survey Stakeholders' perceptions of benefit, we synthesized themes from the interviews with indicators of impact articulated by Worts (2016) and Jacobsen (2016). We used these indicators to develop a close-ended quantitative framework that survey participants responded to on a Likert-style rubric. These close-ended questions were augmented by qualitative open-ended responses that added context to the quantitative framework. See Appendix B: *Survey Administered to Stakeholders*.

SEMI-STRUCTURED INTERVIEWS ANALYSIS

During the semi-structured interviews, we posed open-ended questions that invited Boards and Leadership to define impact, and we invited Leadership to discuss how they use data to evaluate impact. The interview prompts were divided into questions aligned to lenses of museum cultural impact identified by Worts (2016): individual impact, community impact, and institutional impact. See Appendix A: *Semi-Structured Interview Prompts for Boards and Leadership*. We conducted each interview remotely, recorded on Zoom and transcribed using Microsoft Word. We conducted the four interviews in February and March of 2021. Each interview lasted approximately 50 minutes.

Following the interviews, we initially developed a deductive, thematic coding scheme driven by Worts's lenses of cultural impact and the fourteen Museum Indicators of Impact and Performance (MIIP) outlined by Jacobsen (2016).

FIGURE 7

Museum Indicators of Impact and Performance (Jacobsen, 2016)

PUBLIC IMPACTS	
A. Broadening Participation	B. Preserving Heritage
C. Strengthening Social Capital	D. Enhancing Public Knowledge
E. Serving Education	F. Advancing Social Change
G. Public Identity & Image	
PRIVATE IMPACTS	
H. Contributing to the Economy	I. Delivering Corporate Services
PERSONAL IMPACTS	
J. Enabling Personal Growth	K. Offering Personal Respite
L. Welcoming Personal Leisure	
INSTITUTIONAL IMPACTS	
M. Helping Museum Operations	N. Building Museum Capital

Since each interviewee cited the Code of Virginia as a major influence on their perceptions of the museum's intended impact, we revised the coding scheme to layer VMNH's six purposes (Purposes) outlined in the Code of Virginia (Purposes, 1988) with the MIIP.

This revision of the coding scheme revealed that some Purposes were tightly coupled with the MIIP. Figure 9: *Crosswalk of Code of Virginia Purposes and MIIP* highlights areas of overlap.

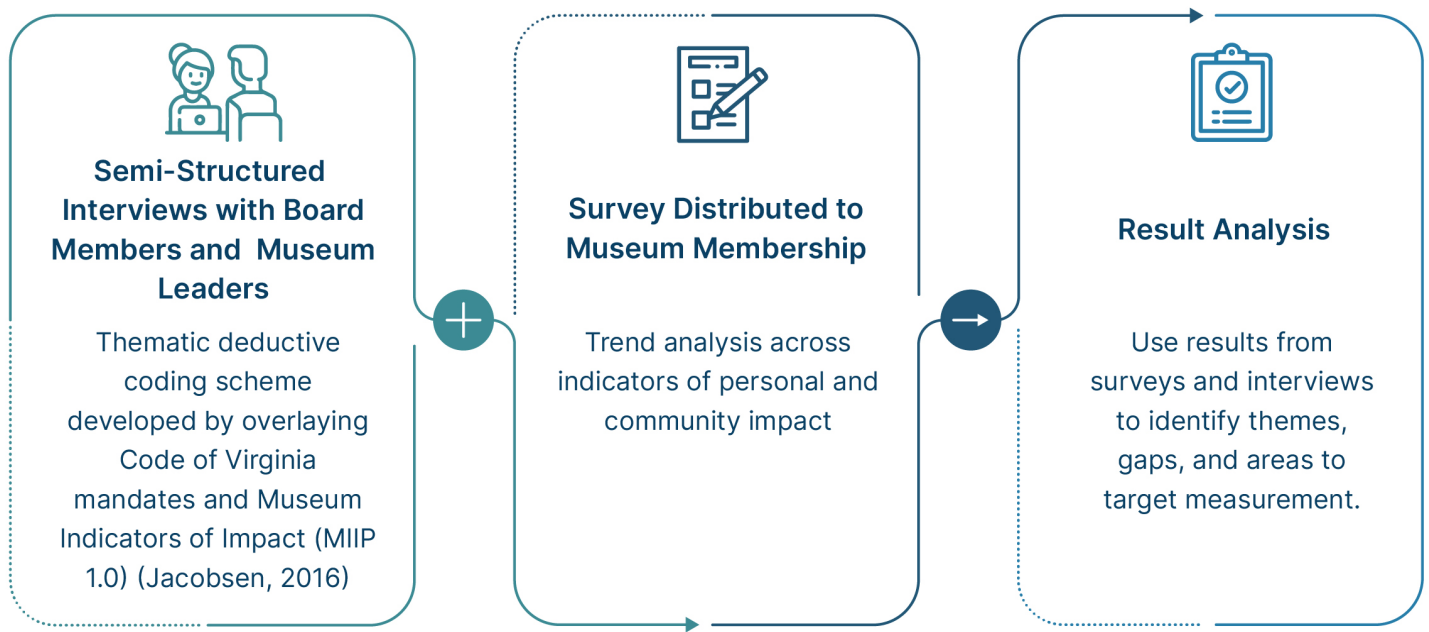
FIGURE 8*Crosswalk of Code of Virginia Purposes and MIIP*

MIIP	PURPOSES
B. Preserving Heritage	<ol style="list-style-type: none"> 1. To investigate, preserve and exhibit the various elements of natural history found in Virginia and other parts of the United States and the world 3. To encourage and promote research in the varied natural heritage of Virginia and other parts of the world 5. To establish a state museum of natural history in Virginia where specimens of natural history, especially those of Virginia origin, can be properly housed, cared for, cataloged and studied and to ensure a permanent repository of our natural heritage
D. Enhancing Public Knowledge	<ol style="list-style-type: none"> 2. To foster an understanding and appreciation of how man and the earth have evolved 4. To encourage individuals and scholars to study our natural history and to apply this understanding of the past to the challenge of the future
E. Serving Education	<ol style="list-style-type: none"> 6. To coordinate an efficient network in Virginia where researchers and the public can readily use the natural history material of the Museum, its branches, Virginia's institutions of higher education and other museums. These purposes are hereby declared to be a matter of legislative determination.

Following development of the coding scheme, we analyzed the interview transcripts through the lens of the 14 MIIP, noting when an interviewee's answers reflected one of the indicators. We marked each mention with a Yes or No per category per interview and also captured quotes as evidence of each indicator mentioned. While most coded interview content aligned to one of the 14 indicators, some responses lived at the intersection of two categories. We made note of these exceptions and created updates to the coding scheme that includes some intersectional categories.

FIGURE 9

Data Collection and Analysis Sequence



For example, the executive director, without having seen the categories before, consistently named outcomes and impacts that spanned multiple categories:

We often measure impact based upon visitation: the number of kids in our classes, the number of teachers who take workshops, the number of people visiting, going into the galleries, who visit our offsite exhibits, right? So as far as those people go, it's so broad, you know, you have people who want to be entertained, right? And so you have that concept of edutainment.

A response like this speaks to MIIP Public Impacts D (Enhancing Public Education) and E (Serving Education) and Personal Impact L (Welcoming Personal Leisure). In some cases, an interviewee would note a gap or non-example of one of the areas of impact. We coded this differently to support further analysis of trends and gaps.

As we coded each interview, we noted the frequency with which areas of impact were noted by each respondent and which areas of impact went largely unmentioned. We created a chart to overlay the themes that were mentioned, how many relevant quotes were identified in each area, and which themes went unmentioned. During coding, we found that while some areas were mentioned by the interviewee as an intended impact of the museum, sometimes the interviewee discussed it in terms of a gap in the museum's reach. For example, all four interviewees mentioned MIIP Broadening Participation in terms of reaching diverse audiences or making strides toward inclusivity, but all of them identified it as a gap and an area that VMNH is prioritizing in the future. The chair of the Board of Trustees noted, "The intended impact is for all citizens of the Commonwealth, yet I think where we fall down a little bit is that we haven't been able to reach everybody." In this case, we chose to code this as an indication of alignment regarding the aspirational goals for impact, while noting the trend.

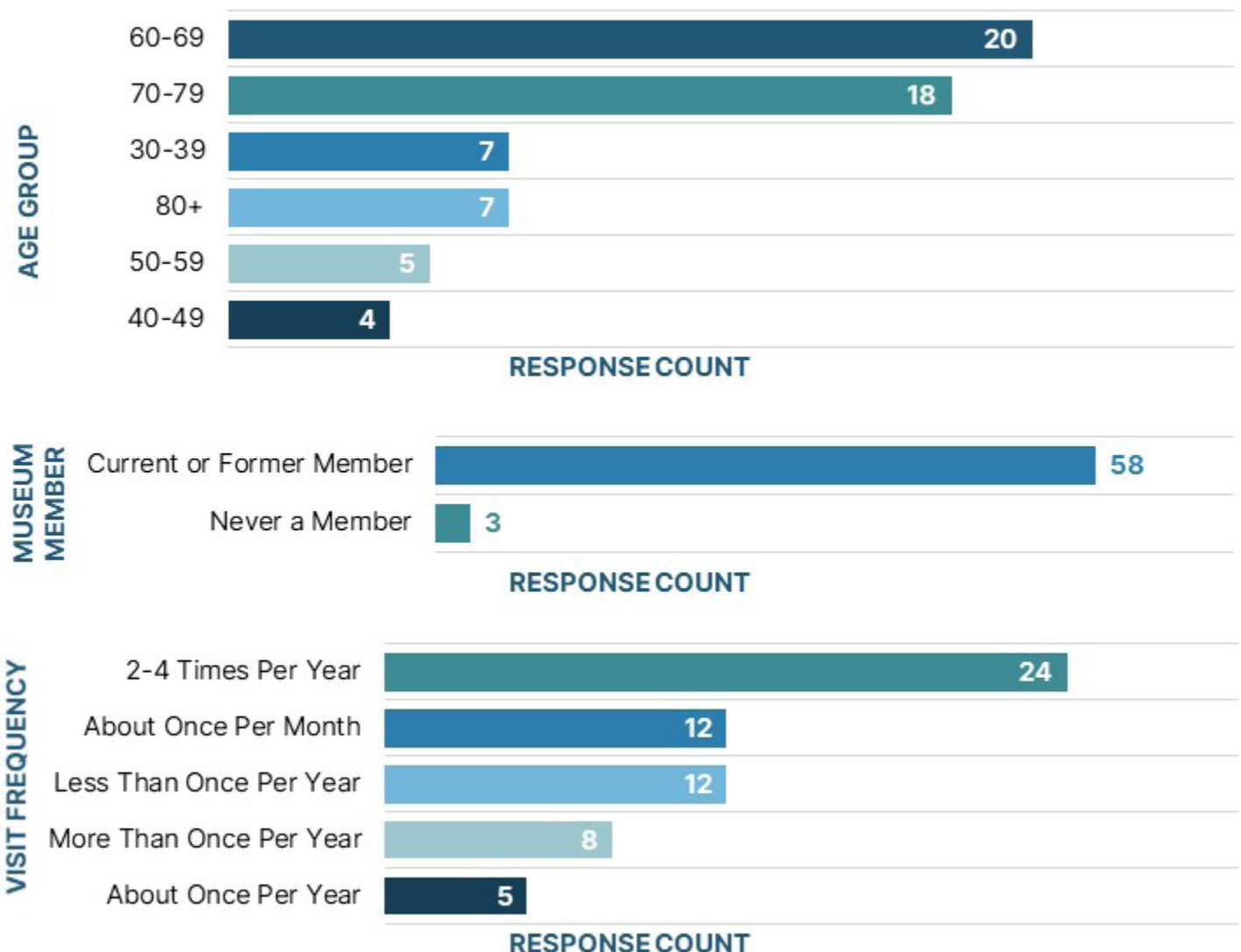
To move from thematic codes to answering the project questions, we revisited the categorized evidence and re-coded the responses to understand which evidence was output data and which evidence was aligned to outcomes. We also noted which outcomes were intentionally measured by the museum, which were anecdotal, and which were aspirational. We noticed that interviewee responses largely tracked the MIIP even though they had no explicit awareness of the framework. Of the fourteen MIIP used to code the interviews, the interviewees were fully aligned in their discussion on six indicators: Broadening Impact, Enhancing Public Knowledge, Serving Education, Contributing to the Economy, Enabling Personal Growth, and Helping Museum Operations. None of the interviewees mentioned indicators of impact aligned to Offering Personal Respite. In the other seven categories, the interviewees had some degree of misalignment in terms of their discussion of aligned impact measures.

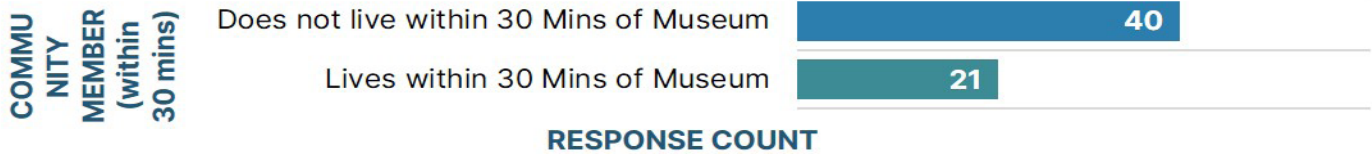
SURVEY ANALYSIS

We used descriptive statistical analysis to understand the stakeholder survey results. Inferential statistical analysis was not appropriate for the scope of this project because we are not attempting to generalize the results to any broader context or form any hypothesis. Our goal was to display the data and identify trends to communicate stakeholder perceptions. We received 61 survey responses, with the following demographic breakdown.

FIGURE 10

Demographic Breakdown of Survey Respondents



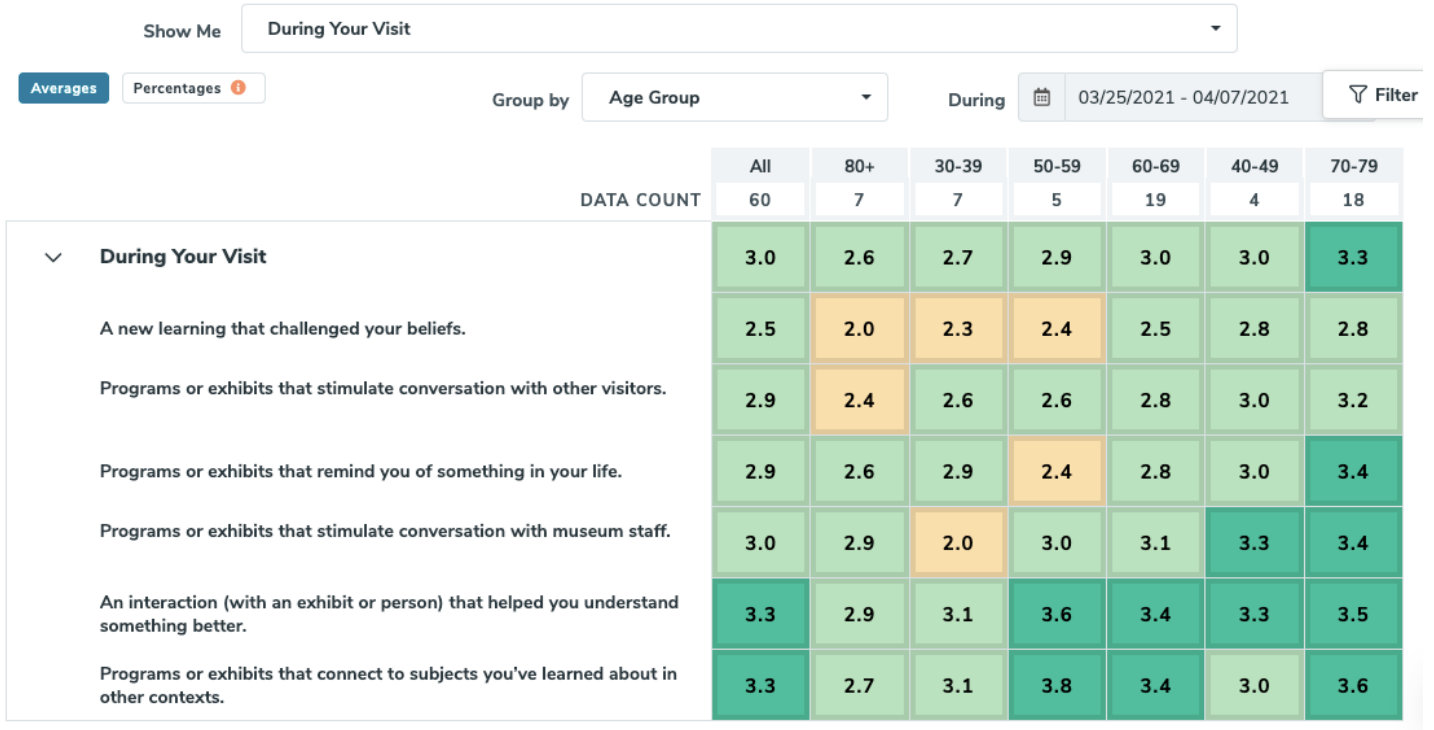


While responses were collected anonymously, the survey began with demographic information that we later used to aggregate responses and identify trends among different types of museum stakeholders. These demographic questions served to identify survey participants' museum membership status, age group, and attendance habits. The survey then prompted participants to consider indicators of impact on the individual level broken down into outcomes and benefits that they could perceive during a museum visit and those that they might experience after visiting the museum. At the end of the survey section about individual impact, the participants received a prompt which asked them if they lived within a 30-minute drive of the museum, an indicator that the respondent represents the local community. This question employed conditional logic to take those respondents who indicated that they lived within 30 minutes of the museum to an additional section where they were prompted to reflect on their perception of the museum's impact on the local community.

Responses were disaggregated by demographic groups in heat maps to identify trends across various groups. A heat map clusters data together in rows and columns and "consists of a rectangular tiling, with each tile shaded on a color scale to represent the value of the corresponding element of the data matrix" (Wilkinson & Friendly, 2008). The heat map displays the data in aggregate by averaging those values and allowing for cross-tabulated analysis based on different demographics. The rubric for the "During Your Visit" and "After Your Visit" sections were a 4 point scale with the following responses to the prompt "To what degree do you experience the following DURING your visit to the Virginia Museum of Natural History?" To process the data, the survey responses are assigned a value from 1 to 4 corresponding to a descriptive indicator on the likert scale: Never (1), Maybe Once or Twice (2), Several Times (3), Most Times while at the museum (4). For example, Figure 12 depicts the average values for responses to various questions asked of survey participants with a demographic breakdown by age group:

FIGURE 11

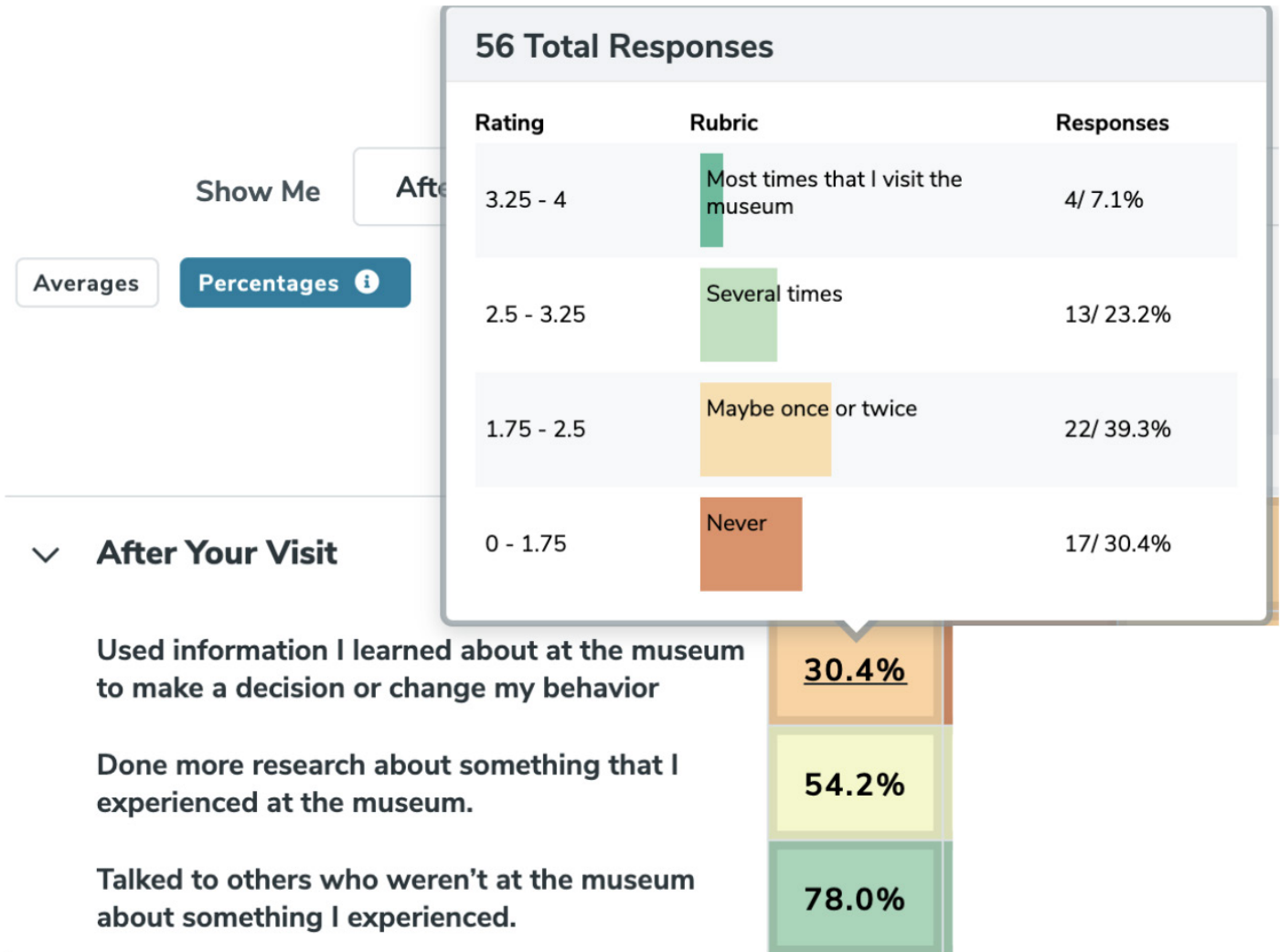
Survey Heat Map Analysis 1



The heat map can display averages using the values assigned to each level of the Likert scale rubric or a percentage view. The heat map in Figure 13 illustrates the percentage of participants who responded to the prompts on the left in the top two rubric categories. We determined that the top two rubric categories represented a measure of consistency and confidence that the individual had an experience that was strongly aligned to an indicator of impact.

FIGURE 12

Survey Heat Map Analysis 2





09

Findings

FINDING 1

Interview responses indicate that the museum's governing boards and executive leadership understand the dimensions of museum impact that could be used as metrics to inform decision making. However, when discussing impact, interviewees often supported claims with anecdotes and output data.

When asked about a way to measure the museum's impact on an individual, one interviewee replied:

I guess one measure might be...in the amount of time that they spend in the exhibits and at the location. You know, whether they, and again it depends on the visitor, but whether they spend money in the gift shop to buy you know mementos or souvenirs of the experience.

Another interviewee, when asked about impact measures, responded with metrics that would fall in Tier 1: Audience Data and Information or Tier 2: Outputs (Butler, Koke, and Wells, 2013):

We do track the visitors to the museum and where they come from using ZIP codes so we know you know where our visitors are coming from locally and then also...the tracking as far as on Facebook to see what demographics are visiting the museum or watching our videos that are being put out there on Facebook, clicks that we're getting through Facebook, who's doing it... I know that when we have events [on Facebook], we have the Groupon.

When asked for examples of impact data, the deputy director provided examples of output data, e.g. ZIP codes, age categories, online reviews, social media engagement and demographics, festival attendance and revenue, "return rate" for events, and asking people where they heard about the museum or the event. He also noted that the museum has collected paper surveys (opting to move away from electronic survey stations) that measure visitor satisfaction.

The executive director spoke holistically to many of the impact categories, landing on output metrics as a jumping off point to impact:

To have impact, you have to have people coming here...When I came in 2010, we were getting about 30,000 [visitors per year]. Prior to the pandemic, we finished the year out at 42,000 so we are on that trajectory to doing better and attracting more people here. But when they built the new building, it was projected that there was going to be 120,000 people per year coming here.

Despite naming indicators of impact across multiple impact categories, Boards and Leadership tend to focus formal and informal evaluation on measures of efficiency, i.e. outputs. For example, one interviewee noted:

We sort of have different ways of tracking visitors, not movements necessarily but just behaviors. The front desk people talk, you know, they'll talk to visitors asking where they're from. We also try to sort of gauge how long it takes people to go through the museum.

This type of measurement aligns more closely with an anecdotal Tier 3 output (Butler, Koke, and Wells, 2013) than an indicator of impact. To this point, Jacobsen writes, “Stephen Weil observed that a museum uses its resources as a means to achieve its ends, and that measurements of a museum’s performance need to include both how effectively it achieves its ends and how efficiently it uses its resources to do the job. He goes further to observe that there is no point in measuring efficiency if you are not being effective” (pg. 83, 2016).

The chair of the Board of Trustees is deeply involved in planning for the proposed Waynesboro branch of VMNH. Many of his responses aligned with not only Tier 3 outcomes (Butler, Koke, and Wells, 2013) but also to aspirational impacts. More specifically, his responses lie in the intellectual and social domain of the Outcomes Hierarchy, outlining ways that visitors are changed as a result of their experiences at the museum. He also spoke anecdotally in way that identifies clear and powerful long-term impacts in a way that the executive leadership currently does not evaluate:

I think any time you get outside of your experience, you know, you get out of what you do day to day and you see something different, it just changes your perspective and so hopefully people would value the natural resources that we have in the Commonwealth and as documented in the collections at the museum.

He went on to note the connections between the museum’s focus on research and collections and the impact those have on visitor experience:

[The museum’s research] helps us to show that the Sciences are evolving as well and we learn things and it changes our understanding of the past and I think that’s an important thing to be able to help to tell the visitors, “It’s not like a static situation. There’s... always new things being added to the collection and that changes our understanding and we can tell new stories.” You know, right now we have the challenge of biodiversity and the loss of biodiversity. And we’re trying to tell the story about why we’re concerned there. That’s what’s important and it comes out of researching the collection.

FINDING

01

RQ1

How do the museum's governing boards and executive leadership currently define impact?

Interview responses indicate that the museum's governing boards and executive leadership understand the dimensions of museum impact that could be used as metrics to inform decision making. However, when discussing impact, interviewees often supported claims with anecdotes and output data.





FINDING

02

RQ2

How does the museum's executive leadership use data to inform decision making?

The museum's executive leadership has access to metrics on attendance, revenue figures, broad engagement measurements, and visitor feedback, but the data is not used consistently to inform decisions.

FINDING 2

The museum's executive leadership has access to metrics on attendance, revenue figures, broad engagement measurements, and visitor feedback, but the data is not used consistently to inform decisions.

Data collection and reporting at VMNH is driven primarily by the state strategic plan, a framework focused primarily on outputs and outcomes (Commonwealth of Virginia, n.d.). The state's performance management system is grounded in metrics that can be counted, e.g. attendance, number of publications, or number of students served by educational programs. There is limited focus on impact, (i.e. how stakeholders are changed by the museum's activities). As a result, the focus of data collection analysis at VMNH at present is on reporting output and outcome measures for the state strategic plan.

Of the 14 MIIP, the state strategic plan is focused most clearly on Building Museum Capital, which is defined by Jacobsen (2016) as indicators that "monitor the museum's long-term resources and assets, both tangible (facilities, endowment) and intangible (brand reputation, type of museum, long-term partnerships); these categories list what the museum is and has. Some of these indicators are reflected in balance statements." Among the interviewees, only the executive director referred to these indicators.

Indicators related to museum capital (revenue, expenses, and other output data), however, are those that Boards and Leadership are best positioned to measure and report. These tend to be the metrics that are most closely linked to the museum's state appropriation, even though they are loosely coupled with the aspirational indicators of impacts named by the interviewees. Because indicators of museum capital are externally defined, the museum's current measurable outputs and outcomes do not always align with the aspirations of Boards and Leadership.

The imperative of compliance might lead Boards and Leadership to miss opportunities to use data for strategic planning and improvement. Leadership has access to metrics on attendance, revenue figures, broad engagement measurements, and visitor surveys, but the data is not used consistently to inform decisions. As a case in point, the deputy director reported:

What we do with the data we could probably improve. It's stored, but it's not necessarily used for anything specific other than adding to our overall picture of where we're at. [There is] disparate data, like we have our Facebook feedback, TripAdvisor, in person surveys...we don't necessarily have a formal method of putting that all together in any kind of meaningful report.

Consequently, when asked what guides the museum's intentions, the executive director noted while the board is responsible for budget and strategy, "Mostly it's the staff who comes to me and says, 'Hey, I think we ought to do this' and then we go and do it and report back to the board. And they say, 'Great, do more of that.'"

FINDING 3

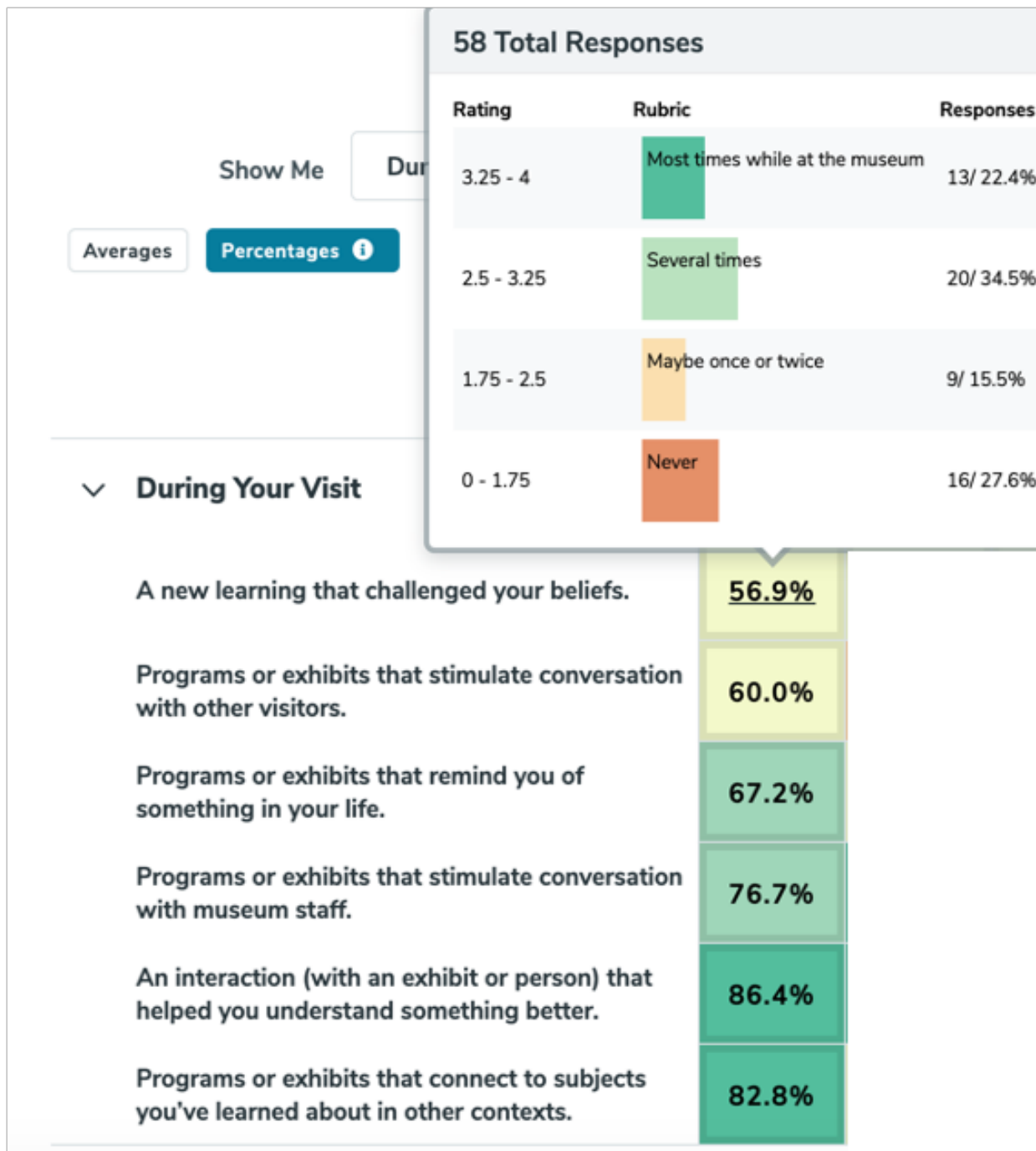
One of the museum's intentional purposes as prescribed by the Code of Virginia is "to encourage individuals and scholars to study our natural history and to apply this understanding of the past to the challenge of the future." However, museum stakeholders report that exhibits and events do not consistently inspire them to apply learning to make decisions or change behavior.

Survey participants were asked to reflect on how often they experience certain indicators of short-term and long-term impact while at the museum, after their visit, and within their community. Among various demographic groups, survey responses were strongest among those who indicated that they have attended more than one festival, which are themed periodic events the museum holds that incorporate educational and entertainment opportunities. The percentages in figure XX represent the percentage of survey respondents who responded in the top two rubric categories in each area.

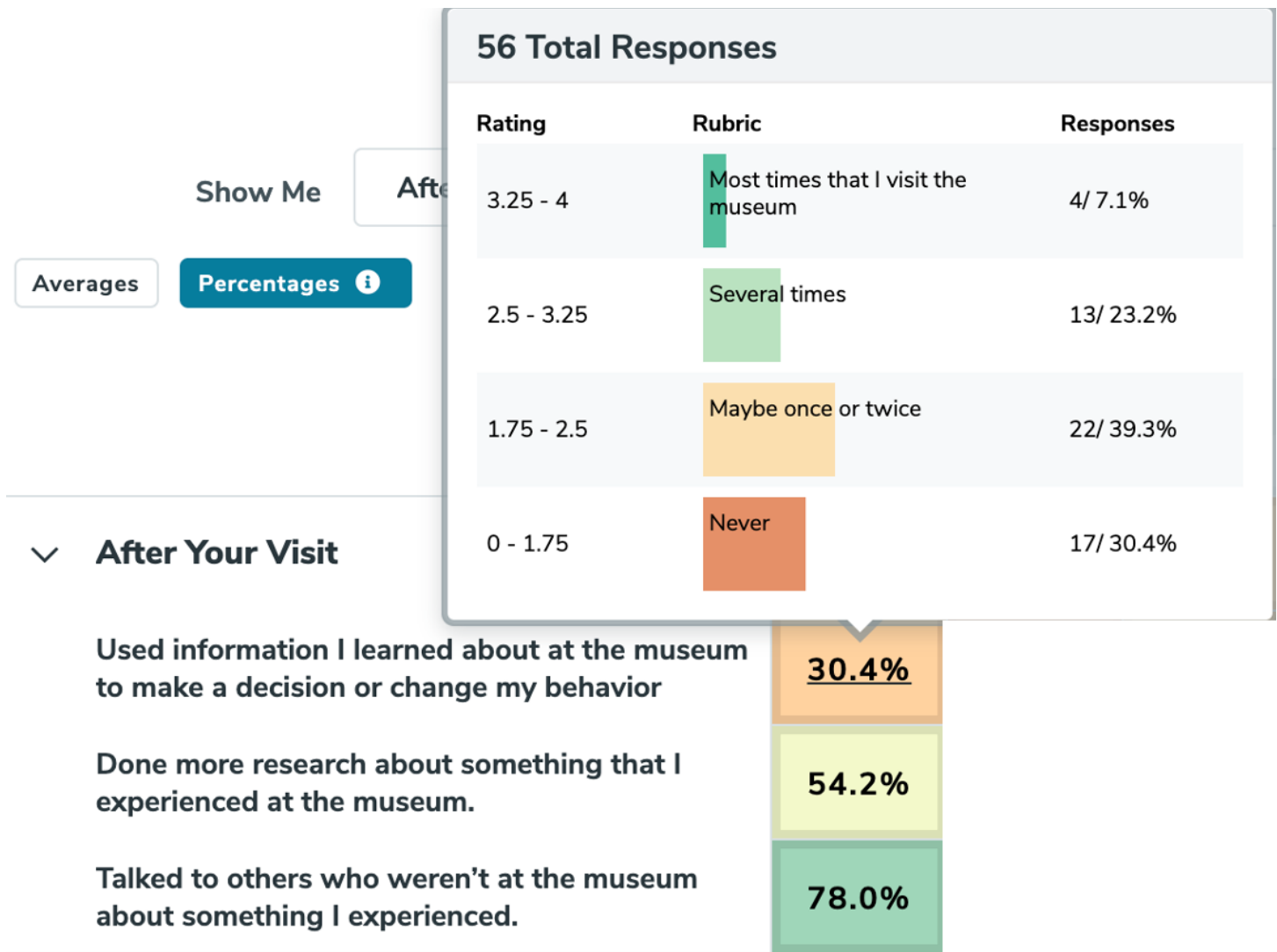
	DATA COUNT	All	Yes, once	No	Yes, more than once
	60		13	8	39
> After Your Visit		55.9%	33.3%	50.0%	64.1%
> During Your Visit		76.7%	69.2%	62.5%	82.1%

On a scale from "Never" to "Most times while at the museum," many indicators of impact during a museum visit were strong. 82.8% of respondents indicated that several or most times while at

the museum did they experience programs or exhibits that connect to subjects they've learned about in other contexts, and 86.4% indicated that several or most times while visiting the museum did they have an interaction (with an exhibit or person) that helped them understand something better. However, museumgoers less frequently encounter new learnings that challenge their beliefs. 56.9% of respondents fell in the top two rubric categories for that indicator of impact.



Further, when reflecting on their experiences after visiting the museum, respondents indicated an even lower frequency when asked how often they “used information I learned at the museum to make a decision or change my behavior.” 30.4% of participants had this experience most or several times after a visit, while 30.4% have never had this experience.



One comment explicitly noted, “It never before occurred to me to make a decision or change my behavior based on anything I saw while visiting VMNH.” Conversely, another open-response answer included significant evidence of impact: “The museum introduced me to the Virginia Master Naturalists, leading me to become a Certified Master Naturalist, now a major activity in my yearly routine.” This aligns with a comment made by the executive director regarding two recently hired members of VMNH staff:

The past two or three years I've had three new hires, all of which were local students as kids, and they would do field trips to the museum... one is now our head of our archaeology program. So he went off and got a PhD and was doing archaeological work for the Department of Defense before joining us. And then another fella went off for college, but wanted to come back to Martinsville because he wanted to be part of the solution of uplifting the community. So he had a job locally in a very successful corporation. But when opportunity struck, he took a pay cut to come work here.

When members of the museum community (those who live within a thirty-minute drive of the museum) were asked to identify their level of agreement, 70.6% of them agreed or strongly agreed that “People in my community take action as a result of their experiences at the Virginia Museum of Natural History.” While not an extremely low percentage, this prompt’s responses were disproportionately lower than the rest of community members’ responses which were collectively quite strong (at 95% or higher agreement).

34 Total Responses

Rating	Rubric	Responses
3.25 - 4	Strongly Agree	9/ 26.5%
2.5 - 3.25	Agree	15/ 44.1%
1.75 - 2.5	Disagree	8/ 23.5%
0 - 1.75	Strongly Disagree	2/ 5.9%

Averages

Percentages **i**

Group by

Show Me In Your Community

▼ **In Your Community**

People in my community take action as a result of their experiences at the Virginia Museum of Natural History.

70.6%

The Virginia Museum of Natural History helps people in my community connect.

95.0%

The Virginia Museum of Natural History is the type of place that I would take visitors from out of town.

97.5%

All different types of people in my community have access to the museum.

97.4%

The Virginia Museum of Natural History is a place that people in my community trust.

97.4%

FINDING

03

One of the museum's intentional purposes as prescribed by the Code of Virginia is "to encourage individuals and scholars to study our natural history and to apply this understanding of the past to the challenge of the future." However, museum stakeholders report that exhibits and events do not consistently inspire them to apply learning to make decisions or change behavior.





Recommendations

RECOMMENDATION 1

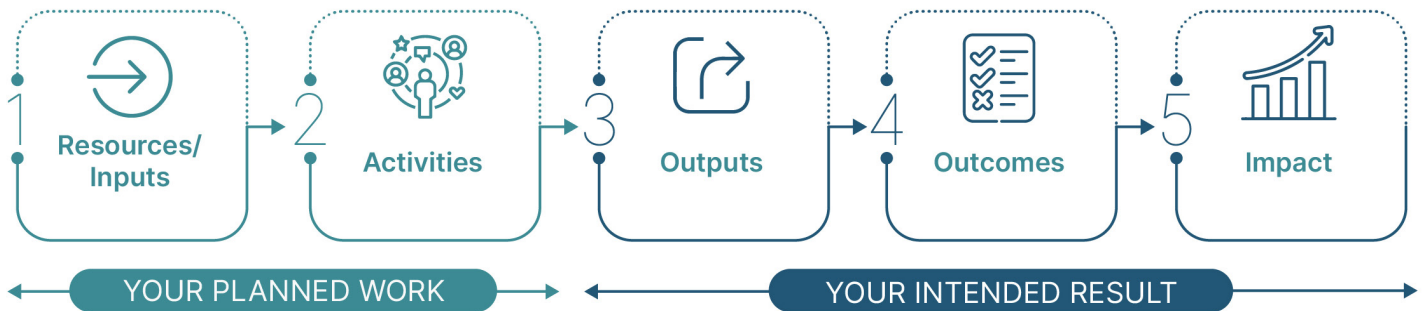
Create an organizational planning and evaluation framework based on the Museum Theory of Action (Jacobsen, 2016).

Jacobsen (2016) articulates the challenges associated with measuring museum impact, asserting that “Measuring impact, while an appealing goal conceptually, is challenging to do head-on, as the basic definitions and methods have eluded the museum field: What impacts? On whom? How do we quantify and then measure impacts?” (p. 64). To address these challenges, he proposes the Museum Theory of Action (MTA). The MTA is a logic model that incorporates indicators of impact which are validated by “periodic evaluations to validate or amend the meaningfulness of a measure as an indicator of impact” (Jacobsen, 2015, p. 64). The MTA builds upon the concept of a traditional logic model to support the link between a museum’s intended purpose and the results produced by its programs and activities. The MTA framework provides museum professionals with an articulated structure by which they can consider all the discrete components that factor into a museum’s ability to achieve its intended purposes.

Basic logic models are sequenced in a single direction to offer “a systematic and visual way to present and share your understanding of the relationships among the resources you have to operate your program, the activities you plan, and the changes or results you hope to achieve” (W.K. Kellogg Foundation, 2004).

FIGURE 13

A Basic Logic Model (W.K. Kellogg Foundation, 2004)



The MTA augments the basic logic model with museum-specific enhancements to create a cycle of feedback that establishes assessment of impact as an iterative process rather than a one-off evaluation. The MTA framework is intended to help museum professionals achieve three objectives: documentation of current program results in comparison to intentions, planning and decision making for the future, and providing a shared language of evaluation across all programming (Jacobsen, 2016, p. 47).

FIGURE 14

Museum Theory of Action (Jacobsen, 2016)

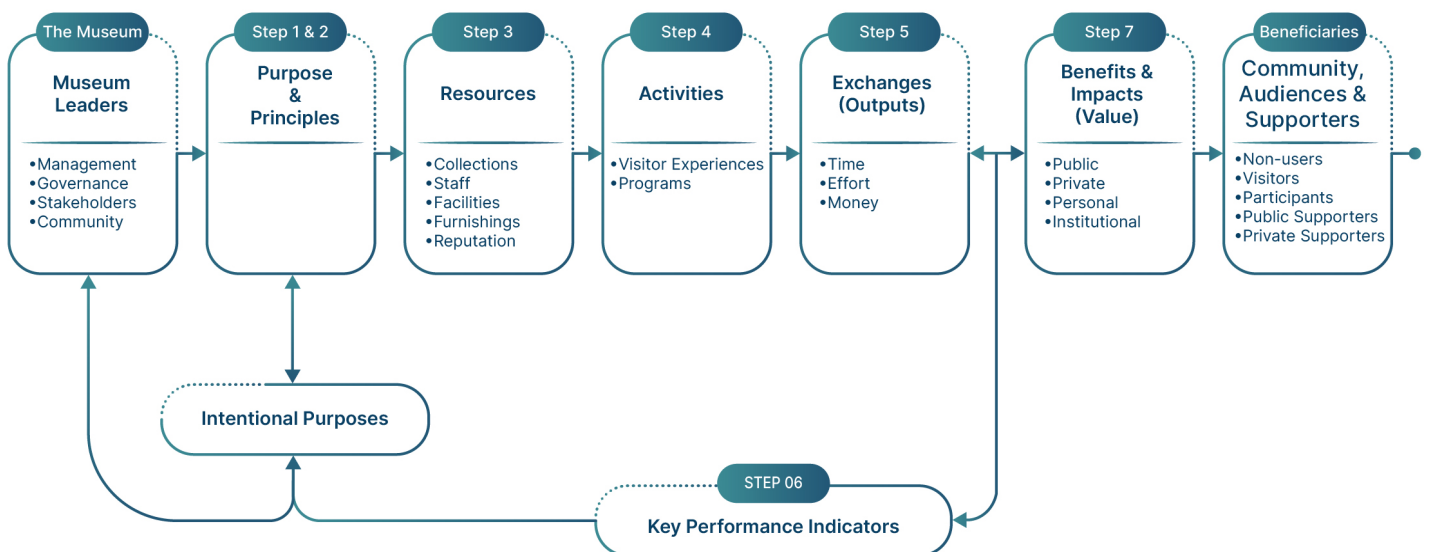


FIGURE 15

Components of the Museum Theory of Action (Jacobsen, 2016)

STEP 01	INTENTIONAL PURPOSES: What the museum wants to deliver.
STEP 02	GUIDING PRINCIPLES: The museum's character, brand identity, and standards
STEP 03	RESOURCES: The museum's collections, facilities, reputation, and people.
STEP 04	ACTIVITIES: The museum's exhibitions, programs, and other services.
STEP 05	OPERATING AND EVALUATION DATA: The annual activity counts and survey findings.
STEP 06	KEY PERFORMANCE INDICATORS: Selected formulas using changes in activity data to measure changes in impact and performance.
STEP 07	PERCEIVED BENEFITS: What audiences and supporters think they receive from the activities.

The annual report prepared response to the state strategic plan, with its focus on outputs and outcomes, is a strong foundation for broader impact evaluation. To support the kind of enhanced evaluation, we recommend that VMNH leadership and staff deploy the MTA framework when planning and measuring the impact of programs and activities. By using the MTA framework, VMNH leaders can gain a comprehensive perspective on the museum's overall performance, deliver programs and activities with increased fidelity, and generate actionable insights. These insights can serve as a foundation for building a culture of continuous improvement at the museum.

RECOMMENDATION 2

Develop Key Performance Indicators (KPIs) aligned with the museum's intentional purposes to measure impact and progress toward strategic goals.

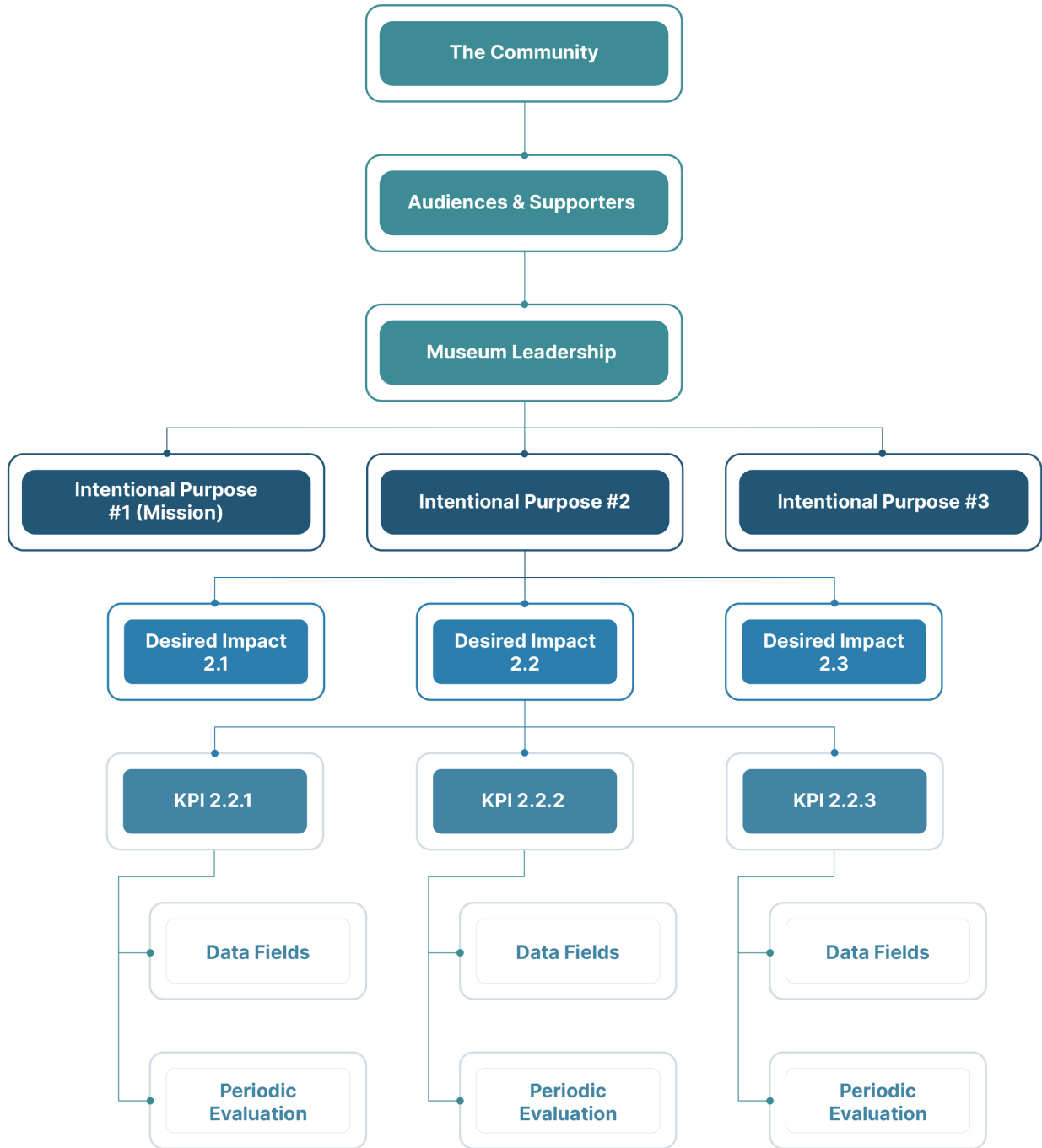
VMNH offers a broad spectrum of programming, from exhibits to education to research and collections. Given the museum's limited evaluation capability, it is unrealistic to assume that VMNH staff can meaningfully measure and understand the impact of each of these discrete program areas. As such, a strategic determination of KPIs as they align to the VMNH's intentional purposes can support a holistic understanding of the museum's performance while remaining manageable without a full-time evaluation staff. Just one well-crafted KPI can provide a glimpse into multiple outcomes-aligned metrics.

For example, "the number of teachers electing to bring their students to a museum (operating data) divided by the teacher population (market data) results in a market index KPI; factor that by the ratio of repeating teachers to get a satisfaction KPI" (Jacobsen, 2016, p. 74). This example can also be extrapolated from an outcome measurement to an impact measurement: "If we assume teachers are expert educators, then their repeated selection of the museum is an indicator of an expert community's assessment of the museum's educational value compared to their other options" (Jacobsen, 2016, p. 75). Of course, there are many factors at play when considering the reasons schools choose to use the museum's educational resources and continue to do so over time, but the cyclical nature of the MTA allows for iteration upon and research about individual or multiple KPIs.

Developing KPIs that are aligned to broad purposes allows for variation in how the KPIs are ultimately explored. At various times, surveys, focus groups, audience data, or other social research may be used to determine influences on KPIs. In developing KPIs, Jacobsen (2016) encourages museums "to use multiple perspectives and multiple measures in order to accommodate the complexity of museum impacts and the likelihood that any single perspective or measure may be misleading to some degree" (p. 77). Figure 17 outlines a recommended strategy for developing KPIs that align to the museum's intentional purposes.

FIGURE 16

Strategy for Developing KPIs (Jacobsen, 2016)



KPI development at VMNH might start with a brainstorm of possibilities that includes a large audience to identify what metrics are feasible to collect, important to measure, and explicitly aligned to purposes and intended impacts. The KPIs should be specific to VMNH and its context and observable with potential to understand growth or change over time. For example, if a museum's purpose is "to contribute to [its] neighborhood's quality of life, and one of [the] desired impacts is that the neighborhood is connected to public resources, then a KPI that divides the number of neighborhood memberships by the total number of memberships might track increasing or decreasing neighborhood connections and use" (Jacobsen, 2016, p. 109). As VMNH works to craft KPIs, the Museum Indicators of Impact and Performance (MIIP) database can serve as a valuable tool, given that there are over 1,000 indicators of impact aligned to the 14 MIIP categories. For example, the museum might endeavor to measure the long-term outcomes of any free admission days, aligned to the MIIP category A. Broadening Participation and subcategory of access. VMNH may want to understand the zip codes and return rate of those who specifically attend on a free or reduced admission day. In terms of internal access and participation, the museum might consider community impacts via their own efforts toward valuing diversity and inclusion by measuring the percentage of employees from minority backgrounds who manage two more staff members. Indicators such as this are spelled out, categorized, and sourced in the MIIP database.

Jacobsen (2016) emphasizes the importance of benchmarking KPIs against peer institutions (p. 116). For VMNH, it will be important to consider peer museums in a variety of contexts. Some museums will be similar based on size while others will be considered peers because they are natural history museums; it will be important to consider those differences. For example, VMNH may consider the KPIs of Smithsonian National Museum of Natural History in some respects but reconfigure the scale appropriately based on size, context, and location. Another important benchmark could be to consider KPIs at museums that are state funded, since the state appropriation metrics will always be a top consideration for VMNH. It could be valuable to understand how other government-funded museums build upon those state-determined output metrics.

RECOMMENDATION 3

Incorporate opportunities into exhibits and events for visitors to take action.

Bringing this recommendation to life could look like partnering with or sponsoring large-scale volunteer opportunities in the region that help participants make connections to the science and research of the initiative. For example, VMNH could partner with the Martinsville Community Development office to offer public programming in conjunction with the Community Resilience Initiative to prepare the community to be a “climate-ready” city in the face of natural disasters. The city is already making strides toward meeting various building and infrastructure benchmarks and working in conjunction with the museum could unify residents and museumgoers toward a common cause rooted in scientific research. The museum stands to be a strong economic driver in the community but also could serve as a resource to engage citizens in the science of urban development or preservation of the area’s natural resources.

An exemplar of museum-community engagement, the Natural History Museum of Los Angeles County centers Community Science as one of the main focal points of their museums. The Community Science Program calls for everyday people to participate in the museum’s scientific research and discovery by documenting nature as they experience it, sharing photos and stories. Then, museum staff share those stories with the public as evidence of the museum’s immersive impact. One such story documents a “BioBlitz L.A.” event in which “a dedicated crew of nine community scientists... managed to document 28 species in one and a half hours, from orb weaver spiders and Argentine ants to flower flies and fox squirrels” (Smart). The story goes on to detail the experiences of one “repeat community scientist” who has participated in several virtual and in-person events that elevate his status from museumgoer to a more immersive experience.

These types of community action initiatives could support a broader attempt at action-oriented engagement, an extension of the current programming that could cultivate and measure long-term outcomes. To foster a deeper engagement, VMNH staff might try developing pipeline programs from their existing educational programming for school-age students as well as adult learners. For example, the museum has a robust education program guide, detailing how students can engage in pre-school programs, programs aligned to state-standards and even delivered at off-site locations, and opportunities to engage through virtual programs and festivals. The museum

could build on this to consider how a young person might progress through these programs to become even more deeply engaged in the museum in a way that might inspire a lifelong impact on knowledge and behaviors.

VMNH staff might consider developing a series of programs that range from low-commitment to high-involvement. For example, participants in a state-standard aligned educational program might be invited to a teen night at the museum. Participants could submit feedback about those experiences to inform future program development. The audience of attendees at teen night could be invited to an educational museum sleepover, a teen ambassador program, a young scientists apprenticeship, or even an internship. One interview respondent mentioned an adult curator camp aimed at deeply involving participants in hands-on science. This type of programming wouldn't be a dramatic shift from the type of programming VMNH already offers, but the museum could benefit from strategic planning in building and evaluating a pipeline of engagement aimed at driving participants toward the next deeper level of engagement.

This type of “pipeline of tiered opportunity” comes to life in the National Museum of Natural History (NMNH) at the Smithsonian Institution's Science Career Access and Learning Experiences (SCALE) program, depicted in Figure 18. SCALE consists of a variety of events and programs geared towards engaging teenagers in taking more direct action within the museum and ultimately via their educational trajectories and within their communities.

FIGURE 17

National Museum of Natural History Science Career Access and Learning Experiences (SCALE)

ACTIVITY	DESCRIPTION
Teen Night Out @ Natural History	An event designed to expose teens to science, research-based, or museum careers
Natural History Investigations Series	A series of four workshops introducing teens to “natural history science, technology, and careers.”
Q?Crew	A volunteer opportunity for teens to interact with museum visitors and the museum’s collections. This program includes opportunities for returning Q?Crew teens to apply to a paid leadership position, training and mentoring new Q?Crew members.
Youth Engagement through Science (YES!)	An intensive mentorship/internship program that tailors teens’ experiences to their professional needs in an immersive way. This program takes a college- and career-readiness approach.

These types of opportunities represent not only a deeper sense of engagement among young people, but open up possibilities for reinvestment in the museum community and possible lifelong impacts on students’ career trajectories. Ideally, programs such as these would instill the knowledge, attitudes, habits, and skills the museum would intend for young people to take out into the world as a result of their natural history museum experiences.



11

Conclusion

Our work on this capstone project has given us the opportunity to take a close look at the impact VMNH leaders want to make, as well as their current capability to leverage impact data as a means for continuous improvement. Armed with this knowledge, we have been able to determine the degree to which desired impact aligns with the current and future benefits reported by museum stakeholders. Our findings indicate that there is much to celebrate.

As we have discussed, VMNH faces challenges both typical to its peers and unique due to its geographic location and its disproportionate reliance on state funds. Notwithstanding these challenges, what VMNH has accomplished during its 33 years of existence is nothing short of remarkable. As part of the museum's most recent AAM accreditation report, Hutterer and George (2010) commended VMNH as a "well-established, well-functioning, and stable institution." Some 11 years later, this assertion remains true. VMNH has weathered the challenges of COVID-19 and is now poised for growth as it prepares to build a branch campus in Waynesboro

It is from this position of strength that VMNH leaders can amplify the museum's effectiveness and accelerate organizational learning by improving its data collection and analysis capability, focusing not only on outputs and outcomes but also impact. Our interviews with museum leaders revealed that both governing and executive leadership have a broad understanding of the impact they want to make and the dimensions of impact they might achieve. However, when asked about measurement, the interviewees tended to conflate measures of output, outcome, and impact; the most recurring focus was on outputs. This reflects a strong focus on meeting the requirements of the state strategic plan and limited institutional effectiveness resources.

State reporting requirements will continue to be a fact of life for VMNH, and given budget constraints, the museum's data and evaluation capability may be challenging for the time being. Creating a dedicated institutional effectiveness role, for example, is not feasible at this time. We hope that our modest recommendations to routinely use the Museum Theory of Action framework and establish compelling KPIs will provide museum leaders with a foundation upon which to build impact-driven evaluation that can be more fully realized as the VMNH staff scales up for the Waynesboro expansion.

Our stakeholder survey made clear that respondents strongly believe that VMNH is upholding its mission and providing valued benefits. Indeed, from the standpoint of those surveyed, there are limited areas for improvement. One opportunity that emerged was to better connect the visitor experience with an impetus for visitors to take action to impact the public good. Our recommendation to intentionally design exhibits and events to include opportunities to take action will augment what is already a robust array of programming.



“

VMNH has weathered the challenges of COVID-19 and is now poised for growth as it prepares to build a branch campus in Waynesboro.





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Appendices

APPENDIX A: SEMI-STRUCTURED INTERVIEW PROMPTS FOR BOARDS AND LEADERSHIP

CATEGORIES	PROMPTS	FOLLOW UP PROBES
Individual Impact	What is the museum's impact on a given individual visitor?	<p>Describe the impact of various museum programs, resources, or exhibits on an individual.</p> <p>Outline the profiles of various visitors.</p> <p>What are the indicators of impact on individuals? How would you know that a visitor was positively impacted?</p>

CATEGORIES	PROMPTS	FOLLOW UP PROBES
Community Impact	<p>What is the museum's impact on--</p> <ul style="list-style-type: none"> ➔ Commonwealth ➔ Regional ➔ Local 	<p>What are some of the museum's perceived impacts in the eyes of the community?</p> <ul style="list-style-type: none"> ➔ Economically ➔ Culturally
Broad Stakeholder Impact	<p>Who are the stakeholders who help define the museum's intended impact?</p> <p>How is that impact communicated?</p>	<p>What are the museum's intended impacts for donors and members?</p> <p>What are the museum's institutional impacts?</p>
Other		<p>Has that always been the intended impact or has that changed over time? How?</p> <p>What might be the gap that exists between the intended impact and the actual impact?</p> <p>Why is there a gap?</p> <p>How does the museum measure this impact?</p> <p>Who is the museum's intended audience?/ Who are the museum's perceived beneficiaries?</p> <p>For whom does the museum presently make the most impact?</p> <p>For whom should the museum seek to make a greater impact?</p>
New Contexts	<p>How has the museum's impact been affected by the pandemic?</p>	<p>As the pandemic subsides, what long-term effects might the museum have to grapple with?</p>

APPENDIX B: SURVEY ADMINISTERED TO STAKEHOLDERS

Virginia Museum of Natural History Survey

8/19/21, 12:53 PM

Virginia Museum of Natural History Survey

Thank you for electing to participate in our research!

For each submission received, \$1 will be donated to the Virginia Museum of Natural History. This survey should take ~5 minutes.

This survey is being administered by the Virginia Museum of Natural History (VMNH) on behalf of researchers from Vanderbilt University's Peabody College of Education. The intention of this research is to investigate the impact of VMNH from the perspective of various stakeholders.

Individuals under 18 are not permitted to participate. Demographic data will be collected in order to analyze data, but please do not share name, email, or any other identifying information. Results will be published in aggregate as part the data analysis of our IRB approved capstone project.

For more information about this research, please reach out to Lynsey.Heffner@Vanderbilt.edu

* Required

- 1) Do you consent to the terms above and agree to willingly participate in this survey? Please mark yes to proceed with the questionnaire. *

Mark only one oval.

- Yes
 No

- 2) Are you or have you ever been a member of the museum? *

Mark only one oval.

- Yes
 No

About You

Demographic data is collected for the purposes of analysis and not identification

<https://docs.google.com/forms/d/1iiEdI69yhSzfEFPwxe2nduK4NO5LetR576yPEug4-84/printform>

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3. Age Group *

Mark only one oval.

- 18-24
- 25-29
- 30-39
- 40-49
- 50-59
- 60-69
- 70-79
- 80+

4. In a typical year, approximately how often do you visit the Virginia Museum of Natural History? *

Mark only one oval.

- More than once per month
- About once per month
- 2-4 times per year
- About once per year
- Less than once per year

5. When visiting the Virginia Museum of Natural History, I MOST OFTEN visit... *

Mark only one oval.

- Alone
- With my household
- With family outside of my household
- With friends
- With a large group
- Other: _____

6. Have you ever attended a VMNH festival? *

Mark only one oval.

- Yes, once
- Yes, more than once
- No
- Unsure

Your Feedback

DURING YOUR VISITS

7. During Your Visits: To what degree do you experience the following WHILE VISITING the Virginia Museum of Natural History?

Mark only one oval per row.

	Never	Maybe once or twice	Several times	Most time while at the museum	N/A
Programs or exhibits that stimulate conversation with other visitors.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Programs or exhibits that stimulate conversation with museum staff.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Programs or exhibits that remind you of something in your life.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Programs or exhibits that connect to subjects you've learned about in other contexts.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
An interaction (with an exhibit or person) that helped you understand something better.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
A new learning that challenged your beliefs.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

AFTER YOUR VISITS

8. After your visits: To what degree have you done the following AFTER your visit to the Virginia Museum of Natural History?

Mark only one oval per row.

	Never	Maybe once or twice	Several times	Most time that I visit the museum	N/A
Done more research about something that I experienced at the museum.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Talked to others who weren't at the museum about something I experienced.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Used information I learned about at the museum to make a decision or change my behavior	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

9. Please elaborate on any of your answers above if you wish.

10. Do you live within -30 minute drive of the Virginia Museum of Natural History *

Mark only one oval.

Yes

No

In Your Community

If you live within ~30 minutes of the Virginia Museum of Natural History, please respond below

11. With your community in mind, please indicate your level of agreement with the following statements.

Mark only one oval per row.

	Strongly Disagree	Disagree	Agree	Strongly Agree	N/A or Unsure
The Virginia Museum of Natural History is the type of place that I would take visitors from out of town.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The Virginia Museum of Natural History is a place that people in my community trust.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The Virginia Museum of Natural History helps people in my community connect.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
People in my community take action as a result of their experiences at the Virginia Museum of Natural History.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
All different types of people in my community have access to the museum.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

12. Please elaborate on any of your answers above if you wish.

APPENDIX C: RECRUITMENT LANGUAGE FOR BOARDS AND LEADERSHIP

Sent via email:

Hello,

I'd love to share a bit more about ourselves and our project. Sammy and I are doctoral students at Vanderbilt's Peabody College of Education in the Organizational Leadership and Learning program. We've partnered with Joe to conduct our Capstone research at VMNH. I've pasted an abstract below and I'm happy to elaborate more if we're able to meet for the interview. However, Joe's description is pretty spot on. We're hoping to dig more into how VMNH measures and assesses impact. One method of our analysis is semi-structured interviews. [Here are the prompts](#) we intend to address in these interviews, in case you'd like to preview them.

Let me know if you're able to lend us an hour or so of your time.

Thank you very much!

Lynsey

Abstract:

The purpose of this study is to identify the impact valued by the VMNH Board of Trustees, executive leadership, members, and community stakeholders and assess the alignment between valued impact and current impact. Findings from this study will be useful in helping the VMNH Board of Trustees and executive leadership to determine and communicate the museum's Public Value and will offer the museum an evaluation framework and assessment tools.

APPENDIX D: SURVEY RECRUITMENT LANGUAGE

Subject: We want to hear from you!

Body: VMNH has partnered with researchers from Vanderbilt University to measure our impact on museum visitors like you! Can you complete this [short survey](#) to support their research? For every response received, the researchers will be donating \$1 to VMNH in appreciation of your time!

These anonymous responses will be used by researchers at Vanderbilt University's Peabody College of Education. No identifying information will be shared and your responses can help inform their research about how the Virginia Museum of Natural History identifies, measures, and communicates its impact.

We hope you'll take 5 minutes to [complete the survey](#)!

APPENDIX E: RECRUITMENT LANGUAGE FOR STAKEHOLDERS



The Virginia Museum of Natural History has partnered with researchers from Vanderbilt University to measure our impact on museum visitors like you!

Can you complete this [short survey](#) to support their research? For every response received, the researchers will be donating \$1 to VMNH in appreciation of your time!



These anonymous responses will be used by researchers at Vanderbilt University's Peabody College of Education. No identifying information will be shared and your responses can help inform their research about how the museum identifies, measures, and communicates its impact.

We hope you'll take 5 minutes to [complete the survey](#)!



