



PURPOSE CASE
BUILT STUDY

The Exploratorium

This San Francisco experiential museum relocated to grow its audience, expand its exhibit space, and create a stronger internal organization.

Executive Summary

Organization

The Exploratorium

Location

San Francisco, California, USA

Construction Type

Renovation

Opening Date

2013

Project Area

330,000 square feet (total campus), 1.5 acres (public space)

Project Cost

\$218 million

S. D. Bechtel, Jr. Foundation Investment

\$15 million



The Exploratorium opened in 1969 with the bold idea of allowing visitors to follow their curiosity and explore scientific phenomena at their own pace. This experiential museum was established in San Francisco's well-known Palace of Fine Arts. As the Exploratorium's popularity and offerings grew, the size, configuration, and location of the Palace posed challenges. Initial plans to renovate and expand this historic facility proved cost prohibitive, especially given seismic requirements that would accompany the project.

In the early 2000s, the Exploratorium decided to change location and renovate a nearly 70-year-old building on San Francisco's waterfront in an area well served by public transit. The capital project had a threefold mission: to grow and diversify the Exploratorium audience, enable expanded exhibits, and support a stronger, healthier organization.

The project had inherent physical as well as legal complexities, and a sizeable fundraising goal. The board of directors led a \$300 million campaign to cover construction and related project costs. An extensive engagement process involved employees as well as community members. A capital project director aggregated and communicated stakeholder input to the project team, which included local firms experienced in development, architecture, and construction management. Outside perspectives were gathered from museums around the world. Collectively, these inputs informed the project design, and an effective internal team structure led to the relocated Exploratorium opening under budget in 2013.

In an accessible location with twice the amount of exhibit space, the Exploratorium attracted thousands of new donors and significantly grew its attendance, helping spark redevelopment along the waterfront. The number of visitors rose from about 550,000 per year before

the move to approximately 1.1 million in the first year of relocated operations, and included a more diverse audience. However, the museum had planned to draw approximately 2.1 million visitors on an annualized basis in the opening two and a half months, and then 1.4 million in the full year that followed. This projection, which was informed by attendance at the new California Academy of Sciences (a neighboring museum), did not materialize.

Increased income from ticket sales and donors was essential, as the Exploratorium was expanding its staff from approximately 300 to 450 people to cover the anticipated rise in visitors and operations. The shortfall in ticket sales was exacerbated when the National Science Foundation, a major revenue source for the Exploratorium, reduced its annual funding for science programs. Elevated staff size and programs, plus higher operating and maintenance costs in the new facility, resulted in expenses that outpaced the museum's changing revenues. Within a year of relocating, this financial reality led to layoffs that caused internal turmoil and generated negative media coverage. At the time of this research, Exploratorium leaders were working with a lowered annual projection for ticket sales and adjusting their economic model.

This case study is based on research conducted by MASS Design Group in July 2015. Funded by the S. D. Bechtel, Jr. Foundation, it illustrates how capital projects can help museums attract new audiences and donors, as well as spur local economic development. It also demonstrates the importance of preparing for internal changes to work culture and operations, and the need to be conservative when projecting new revenues following a move.

Purpose Built Series

Capital projects often bring lasting benefits to organizations and the people they serve. Given this opportunity, US foundations grant more than \$3 billion annually to construct or improve buildings.ⁱ Each capital project affects an organization's ability to achieve its mission—signaling its values, shaping interaction with its constituents, influencing its work processes and culture, and creating new financial realities. While many projects succeed in fulfilling their purpose, others fall short of their potential. In most instances, organizations fail to capture and share lessons learned that can improve practice.

To help funders and their nonprofit partners make the most of capital projects, The Atlantic Philanthropies and the S. D. Bechtel, Jr. Foundation commissioned *Purpose Built*—a multi-faceted study by MASS Design Group, a nonprofit architecture and research firm. In 2015 and 2016, MASS conducted interviews, reviewed literature, and examined a diverse set of completed projects around the world; each project was supported by one of the above funders.

The study generated a set of core principles as well as tools for those considering or conducting capital projects:



Introducing the Purpose Built Series is an overview of the study and its core principles.



Making Capital Projects Work more fully describes the *Purpose Built* principles, illustrating each with examples.



Planning for Impact is a practical, comprehensive tool for those initiating capital projects.



Charting Capital Results is a step-by-step guide for those evaluating completed projects.



Purpose Built Case Studies report on 15 projects to illustrate a range of intents, approaches, and outcomes.

See the full *Purpose Built* series online at www.massdesigngroup.org/purposebuilt.

ⁱ Foundation Center, *Foundation Maps* data set based on grants made in the US, 2006-2015.

“Without a big project like this—[one] that was visible and had some civic pride associated with it and so forth—we wouldn’t have had the opportunity to tell the story of the Exploratorium to the philanthropic community of San Francisco.”

**—Board member,
The Exploratorium**



Above. The Exploratorium’s bulkhead entrance on a historic pier along San Francisco’s waterfront. The pier is easily accessible via public transportation and well placed to draw both tourists and local visitors to the museum.

Cover. The building’s Bechtel Central Gallery houses diverse exhibits.

Introduction

The Exploratorium is known internationally for providing environments and experiences that spark curiosity and individual learning. The museum emphasizes hands-on exploration through engaging exhibits drawn from the spectrum of life, physical, and social sciences. For four decades, the Exploratorium operated out of the Palace of Fine Arts, located in the northwest corner of San Francisco. The Palace is a historic Beaux-Arts building built for the 1915 Panama-Pacific International Exposition. Placed within a city park, this impressive structure has become a San Francisco landmark. The museum leased this facility from the San Francisco Recreation and Parks Department.

Since its founding, the identity of the Exploratorium was heavily tied to its location at the Palace. As one staff member recalled, the organization was “born in [that building], and where [its] sense of identity ended and the building began was difficult to discern.” As the museum grew in popularity and evolved over time, however, the Palace placed significant limitations on what the Exploratorium could achieve.

LIMITED ACCESS FOR VISITORS AND STAFF

A 30-minute bus ride from the nearest Bay Area Rapid Transit (BART) station, the Palace was inaccessible to many people in San Francisco and the larger region. Although the Exploratorium drew approximately 550,000 visitors annually, its leaders believed the museum could reach a wider audience of Bay Area residents and tourists with a more accessible site.

The Palace location was hindering the Exploratorium’s ability to bring science and experiential learning to many demographic groups, as well as limiting the diversity of its staff. This location was at least an hour commute by public transit from less affluent neighborhoods in San Francisco and from the neighboring city of Oakland. For example, young people enrolled in the Exploratorium’s Explainer program—which hires and trains high school students, including some from low-income school districts, to introduce exhibits to visitors—often had to travel up to 90 minutes each way.

LIMITED SPACE AND FLEXIBILITY FOR EXHIBITS

Space constraints at the Palace prevented the museum from expanding and developing exhibits. While an open layout allowed exhibit designers to modify the museum space as new exhibits took shape (a practice that was instrumental in cultivating the Exploratorium’s unique do-it-yourself culture), the Exploratorium had outgrown the



Above. The Exploratorium was previously housed in the Palace of Fine Arts, a Beaux-Arts building constructed for the 1915 Panama-Pacific International Exposition.

140,000-square-foot building. As one staff member recalled, “[We were] busting at the seams, the floor [was] fully programmed, [and we could no longer] treat the floor as a canvas for new work.” The terms of the Exploratorium’s lease also prevented use of outdoor space for exhibits. The museum’s exhibit designers felt limited by these conditions and envisioned a space that could provide new opportunities to develop exhibits related to the natural environment.

WORK CULTURE AND WORKPLACE CHALLENGES

The Palace also posed challenges for the Exploratorium’s internal culture. Developed in 1915 as an exhibit space, the building was not designed to function as a contemporary workplace. The Exploratorium’s staff had grown to the extent that people needed to be housed in two buildings; some felt that this separation prevented collaboration and integration across departments. The office spaces were outdated and poorly ventilated, and the age of the building made it difficult to keep spaces heated and comfortable for staff and visitors.

IMPLICATIONS OF RENOVATING AND REMAINING IN PLACE

Given these significant issues, the Exploratorium considered improving and expanding its space within the Palace of Fine Arts. An architecture firm created a schematic design for a relatively modest renovation priced at \$30 million; the initial feasibility study by external consultants indicated that this amount was within the Exploratorium’s fundraising reach. However, subsequent due

diligence found that the Exploratorium faced far greater costs to ensure that this project would conform to the current seismic requirements in earthquake-prone San Francisco. The budget for renovating the Palace would therefore grow dramatically, and the majority of these costs would be spent underground rather than on visitor and staff spaces.

Even if the organization stayed and improved the space, its location would remain inaccessible to those using public transit. A final consideration involved the Palace’s location on the grounds of a city park; the Exploratorium would always face a heightened level of regulation and lack of autonomy given this reality.

Project Mission

It became clear that renovating the Palace would not fully address the Exploratorium’s current needs and future ambitions. A larger and more accessible building was required to help the museum increase its visitors and offerings. The Exploratorium abandoned plans for renovations at the Palace and opted to move to an entirely new location.

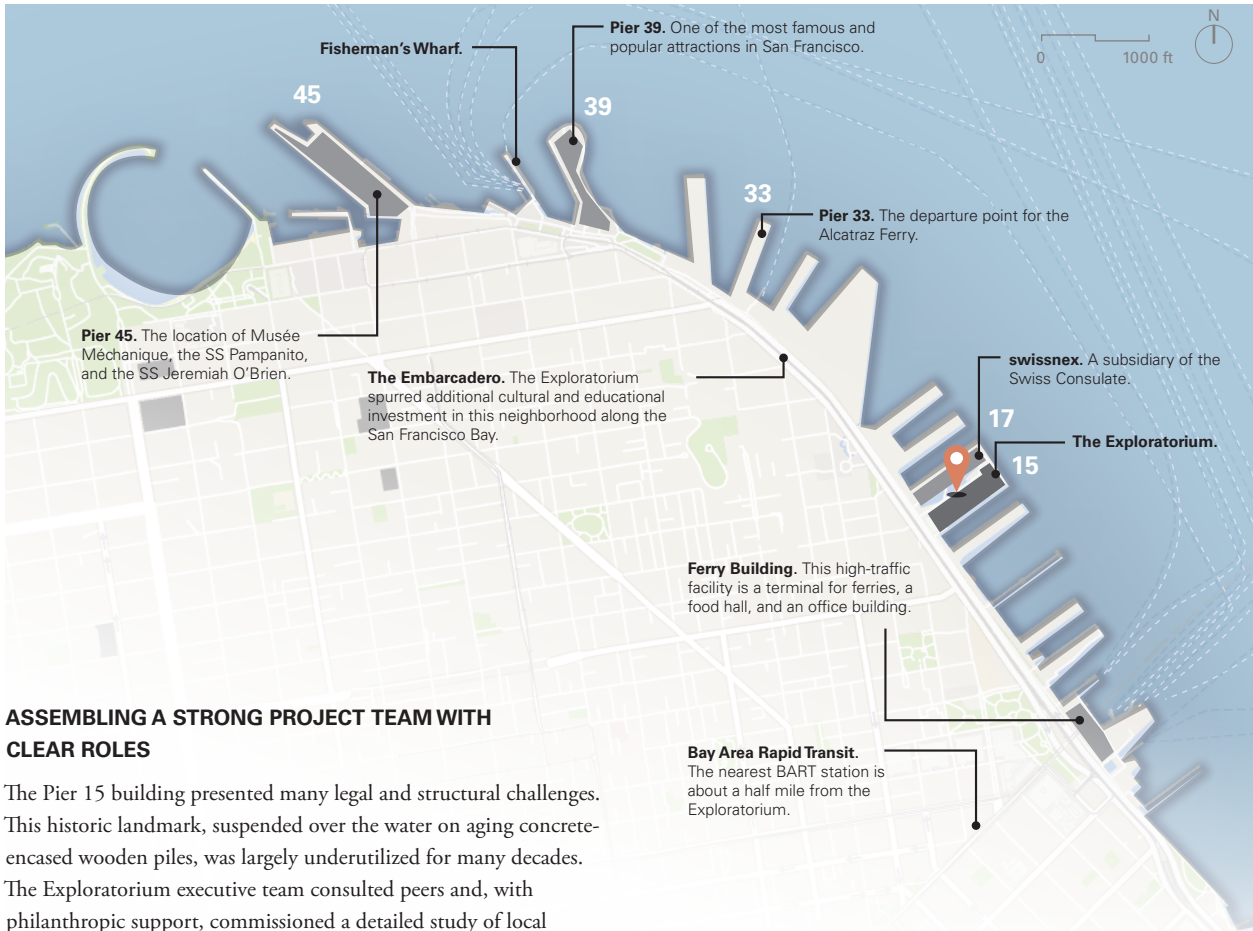
The resulting capital project had a threefold mission: to grow and diversify the Exploratorium audience, enable expanded exhibits, and support a stronger, healthier organization.

Process

SELECTING A NEW HOME IN SAN FRANCISCO

To attract new and diverse visitors, the Exploratorium needed a central location accessible to public transit. A Site Selection Committee, made up of Exploratorium staff and board members, considered a number of places in San Francisco before choosing Pier 15, a historic, nearly 70-year-old port building on the Embarcadero waterfront. A streetcar stop is across from Pier 15, and city bus lines serve this location, which is only 30 minutes from downtown Oakland via BART. At a midpoint between the Ferry Building and Fisherman’s Wharf, the location is well placed to draw residents of the Bay Area as well as tourists.

The Port of San Francisco, a semi-independent commission appointed by the City of San Francisco to oversee port facilities, owned Pier 15. Renovating the facility required approvals from community stakeholder groups as well as local, state, and federal agencies.



ASSEMBLING A STRONG PROJECT TEAM WITH CLEAR ROLES

The Pier 15 building presented many legal and structural challenges. This historic landmark, suspended over the water on aging concrete-encased wooden piles, was largely underutilized for many decades. The Exploratorium executive team consulted peers and, with philanthropic support, commissioned a detailed study of local capital projects including the California Academy of Sciences and the San Francisco Museum of Modern Art. Through these efforts, Exploratorium leaders were able to anticipate potential pitfalls and recruit internal and external experts to fill gaps in needed skills and experience.

The Exploratorium hired the real estate development firm Wilson, Meany, Sullivan (WMS) to serve as developer. This firm had recently renovated the Ferry Building, the first successful local restoration project achieved through public-private partnership. WMS was responsible for the Exploratorium's lengthy and complex entitlement process (which lasted from 2006 to 2010), community engagement requirements, and account management. For oversight of the actual renovation, the Exploratorium hired KPM Consulting, another local firm, to serve as the owner's representative and the overall project manager, responsible for managing the designers, construction contractors, and all sub-contractors.

To lead design, the Exploratorium hired EHDD, a user-driven San Francisco architectural firm. EHDD, together with members of the

board and the project team, visited 25 facilities in seven cities to learn about the design, programming, and construction for a mix of institutions—including but not limited to museums. During visits, the team also evaluated what was and was not working at each locale. Referring to this exercise, one project team member reflected, "It really bonded both the staff leadership team and the key members of board together in terms of . . . what we thought would work for us, [and] what our design sensibilities were going to be."

To inform design decisions for renovating Pier 15, the Exploratorium also drew heavily on internal staff knowledge. The museum held periodic visioning sessions involving staff, and regularly consulted curators who represented each of the six planned exhibit galleries. The Staff Building Committee—which included the chief financial and operating officer, the director of exhibitions, and the capital project director—was charged with obtaining user input, creating the design brief, interfacing between the designers and staff, and managing the transition to the new space.

The Staff Building Committee was supported by a Board Building Committee and the chairman of the board, who were responsible for raising funds for the Exploratorium's \$300 million capital campaign. This total budget featured \$223 million for engineering and construction. Other costs involved project administration including public compliance; user engagement, research, and creation of new exhibits; and relocation of staff and physical assets to the renovated facility.

The capital project director was a new, fixed-term role within the Exploratorium, responsible for aggregating and circulating information among all key parties—staff, the Staff Building Committee, the Board Building Committee, and external consultants. Clarity on project roles and accountabilities, good communications, and a sound combination of internal and external expertise were central to the workings of this complex capital project—and to its under-budget and on-schedule completion.

ENGAGING BOARD MEMBERS AND THEIR TALENTS

The Exploratorium leveraged the project to attract new people to the board, which grew from 20 to 40 members. These leaders had significant experience in the local construction industry, marine dredging, and finance. Through the planning and construction phase, the Exploratorium relied on the expertise and connections of board members for fundraising, contract negotiation, and budgeting. For example, guided by experienced members on the Board Building Committee, the Exploratorium took an informed risk and purchased all of its steel at the low point of the recession, when prices were reduced—even though the building design was not yet fully developed. These same members were able to help negotiate change

orders and claims from sub-contractors to minimize costs. Their experience also informed the creation of a large reserve to respond to problems as they arose. At the urging of a board member experienced in large project management who also chaired the Board Building Committee, the Exploratorium kept a 12 percent construction contingency and a 17 percent owner's contingency for the entire project. These financial management techniques—which are normal for complex projects with many unique conditions, especially when the design is not yet complete—allowed the Exploratorium to contend with challenges as they arose without threatening the overall project budget.

Board members contributed funds that comprised 75 percent of the campaign goal. The chairman of the board suggested that the museum connect with foundations and independent philanthropists from Silicon Valley “because we had a couple of young entrepreneurs who . . . loved the [Exploratorium] and were very central to the Silicon Valley [community], making it much easier to recruit people.” Several new board members from Silicon Valley were important to the campaign, as donors and as connectors to other philanthropists who supported the project.

DESIGNING AN EXHIBIT-FOCUSED SPACE

Through the visioning process with EHDD, the Exploratorium chose to have the architecture of the building recede, ensuring that its exhibits took center stage. To achieve this effect, the design would retain Pier 15's open floor plan and high ceilings with office spaces floating above the museum floor. The interior would be painted a uniform neutral color, both to control glare from San Francisco Bay and to draw focus to the exhibits.

Extensive user engagement featured charrettes with executive leaders, staff, local community members, and people drawn from the worldwide museum community. Through their inputs, the Exploratorium programmed its 330,000-square-foot campus with a more varied collection of exhibits. The new building would accommodate galleries of multiple scales and lighting schemes, including the Bechtel Central Gallery, a massive full-height space with room for extremely large exhibits.

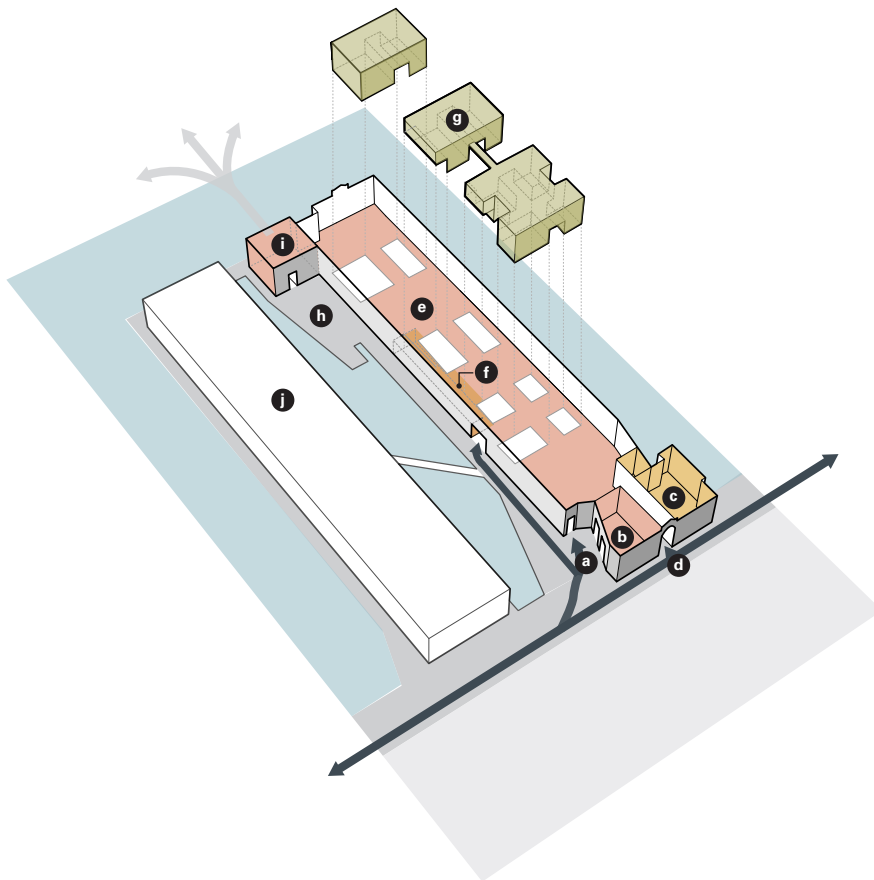
PLACING SUSTAINABILITY AT THE FOREFRONT

The Exploratorium achieved LEEDⁱⁱ Platinum certification and sought to be as close as possible to a net-zero energy operation. The design incorporated 23 building systems including many sustainable



Above. The new Exploratorium offers free admission to many students from local and regional schools that visit on field trips.

ii LEED, or Leadership in Energy & Environmental Design, is a globally recognized symbol of excellence in green building. Source: <http://www.usgbc.org/articles/about-lead>.



The Exploratorium

- a. Main Entrance**
Visitors arrive through a large exterior plaza before entering the Exploratorium.
- b. Café and Store**
- c. Theatre**
- d. Bulkhead Entrance**
Visitors enter the Exploratorium from the Embarcadero and are greeted by an interior gallery that tells the story of the Exploratorium's construction at Pier 15.
- e. The Museum Floor**
The museum floor holds the Exploratorium's many exhibits, including the Tactile Dome, Life Sciences Lab, and Dolby Atrium, among others.
- f. Exhibit Development Shop**
- g. Staff Offices**
Office locations bring staff in contact with museum exhibits and visitors. These offices were designed to be connected via catwalks, although one catwalk was cut from the final project.
- h. Outdoor Exhibits**
The North Gallery's outdoor exhibits afford a unique opportunity not available in the former location at the Palace.
- i. Restaurant and Observatory**
The restaurant is located on the ground floor. The Observatory on the second floor offers views of the Bay.
- j. Pier 17**

alternatives such as solar panels, rainwater capture, and a bay water heating and cooling system that was entirely unique to the Exploratorium. Project leaders chose to make the building itself an exhibit, highlighting its construction and mechanical systems to demonstrate energy sustainability and efficiency. They invested in extensive documentation of the Pier 15 renovation process, from dredging, to the restoration of the timber piles, to the installation of building systems—with plans to integrate this information into museum exhibits as well as a series of books.

SUPPORTING STAFF COLLABORATION AND WORK CULTURE

The organization envisioned a new building that would increase staff morale, improve collaboration, and remove silos between departments. The architects created three pods of open offices with low partitions between desks and small, glass-walled rooms for meetings and calls. To reach their offices or attend meetings in other pods, staff would walk across catwalks above the museum floor. This design intended to connect staff to museum visitors and exhibits on a daily basis. Due to cost cutting measures, the final build included only one of two catwalks recommended in the design stage.

Impact

The Exploratorium began operating in its new location in the spring of 2013. Despite the complexity of renovating a historic, Port-owned property, the Exploratorium completed this capital project under budget, at a total of approximately \$218 million (the projected budget was \$223 million).¹ The building has proven to be a valuable asset to the organization, helping the museum reach a wider, more diverse audience and catalyze additional development along the waterfront.

While the Exploratorium's planning process anticipated and navigated project compliance and construction challenges, it did not fully predict the new building's effect on the museum's work culture, operations, or revenue model. In the year after the move, the organization endured significant growing pains and economic challenges.

EXPANDING AND DIVERSIFYING AUDIENCE

The Exploratorium attracted about 550,000 visitors at the Palace of Fine Arts in 2012, the year before its move. In its first full year



Left. Staff members test new ideas and technologies in the exhibit development shop, which is seen from the exhibit floor as part of the visitor experience.

Below. Three pods of open offices were designed to foster collaboration among staff.



at Pier 15, April 2013 through April 2014, this number grew to approximately 1.1 million visitors—a substantial increase (although well below projections).² The organization was able to attract a more diverse audience, including low-income visitors and people of all ages.ⁱⁱⁱ Through specific programs serving these populations, including students from local and regional schools, the Exploratorium also increased its number of free visits to 160,000, up from 60,000 at the Palace. The Exploratorium’s Thursday night “After Dark” program, focused on young adults, drew five times the visitors it did at the Palace.³

SPURRING DEVELOPMENT ON THE WATERFRONT

The Exploratorium’s redevelopment of Pier 15 contributed to the transformation of San Francisco’s waterfront, creating a corridor for tourists from the Ferry Building to Fisherman’s Wharf. Mayor Ed Lee said the Exploratorium is “making our waterfront more accessible for residents and visitors.”⁴ Other organizations have followed suit and relocated to the waterfront. As one staff member described, “We have a little innovation neighborhood going on. Autodesk moved into Pier 9—I think they opened before we did, but they definitely knew we were coming when they got that space. Then we have swissnex, [a cultural arm] of the Swiss consulate . . . in Pier 17, and we have another innovation lab. One could say that’s part of a macro thing that’s happening in the Bay Area, but I think being here has changed our little pier radius.”

GAINING NEW EXHIBIT SPACES, AND CHALLENGES

The new 330,000-square-foot campus includes 100,000 square-feet of exhibition space—more than double the amount at the Palace. Outdoor spaces at the Pier 15 site enable the Exploratorium to create exhibits dealing with new subject matter. The Observatory, for instance, contains exhibits exploring the relationship between the built and the natural environment, and uncovered dock space around the building features exhibits that connect visitors to the San Francisco Bay. As one staff member stated, “The fact that we are physically here in this environment on a pier with outdoor space . . . opened up new areas we could work on, like the environment, which we couldn’t do much with at the old place.”

In other ways, though, staff felt constrained by the new facility. For instance, because the floor panels used radiant heating and original walls had historic status, staff were unable to drill holes into the floor or ceiling to anchor exhibits—a practice they had used in the

iii *The number of households visiting the Exploratorium grew fourfold to 44,000 in 2014, providing another indicator of audience expansion in the new location. Source: Grant reports provided by the S. D. Bechtel, Jr. Foundation.*

Palace—without consulting with the Staff Building Committee. Some felt that this negatively affected the way the Exploratorium operated, as it curbed the autonomy of exhibit designers and required them to seek approvals before creating or installing exhibits. As one staff member said, the implications have “been difficult and [have] definitely impacted how [we] are able to design.” The staff member added that the length of the planning process for exhibits harmed the museum’s do-it-yourself culture and impeded rapid prototyping. These attributes had been hallmarks of the Exploratorium work style in the Palace.

There were practical reasons for the new protocols, including a need to prevent costly damage to the building’s complex internal systems. But more broadly, Exploratorium leaders considered the increased controls to be part of a necessary shift in organizational culture, toward more structured and strategic ways of working. As the organization scaled up, leaders felt it could no longer afford to operate in the organic and opportunistic manner of years past—and for some staff, this was a painful reality to adapt to. To ease the transition, the Exploratorium hired an EHDD architect to join the staff as a full-time project director for the campus. Complementing the director of facilities and operations, this position was created to support staff in using the new building effectively, while preserving its aesthetic and structural integrity.

The ambition of using the building itself as an exhibit on sustainability had not been fully realized at the time of this study. While documentation of the construction process is featured in the public bulkhead lobby of the Exploratorium and books on the subject are available for sale, lessons from the building and its systems had not been integrated into the exhibit galleries or programming in any meaningful way at the April 2013 opening. Some staff members stated that it was difficult to develop this content prior to locating to the new facility. The Exploratorium planned to address this through a design charrette to identify ways to incorporate sustainability curriculum into the visitor experience.

NURTURING WORK CULTURE WITH MIXED RESULTS

The design of the Exploratorium office spaces had mixed success in bringing together staff members following the move. Most offices are connected by a catwalk, which enables people from different departments to cross paths and engage in informal conversation. However, cost-cutting measures forced a second catwalk to be omitted from the final design. As a result, the teaching and research offices are not connected to the others. A number of staff members stated that this department is now more isolated from the rest of the Exploratorium.

The open office spaces received mixed comments from staff. While some stated that this layout improved collaboration, others felt that it

increased distractions, eliminated privacy, and impeded productivity. In some small spaces, partial partitions were added to desks to create more privacy, and some meeting rooms were taken over as ad-hoc office spaces. The decision to locate the offices above the museum floor also resulted in a lack of exterior-facing windows. The design incorporated glazing that brought in ambient light but limited the staff's access to direct light and fresh air.

The intent to connect staff to visitors on the museum's main floor has resulted in positive as well as neutral reactions. While some staff members indicated that they feel more connected with the visitor experience as they walk across or above the exhibit floor, others felt that this layout did not influence the organization in any meaningful way.

ADDRESSING MISALIGNED FINANCIAL PROJECTIONS

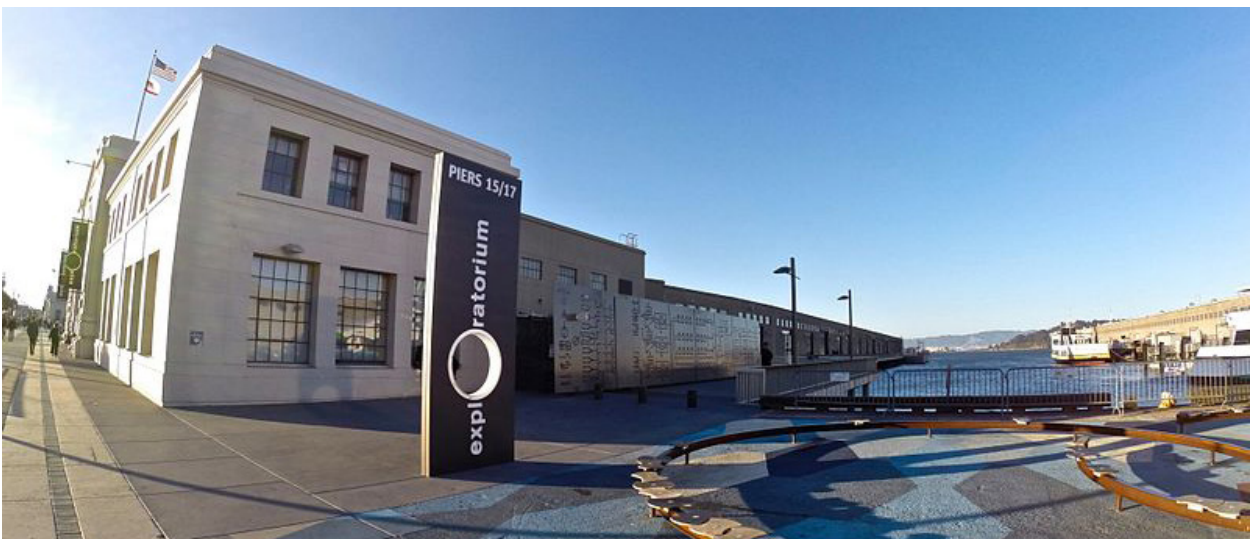
Exploratorium leaders knew that the dramatic change in the scale of the facility would also create a significant change in operations. The new building required many more staff to operate greater exhibit space as well as expanded programs and admissions. Over the course of the capital project, the museum's staff grew from approximately 300 members at the Palace to 443 on opening day at Pier 15. The organization developed new accounting, human resources, and transactional management systems, and evolved its leadership team to plan and implement the capital project.

While the Exploratorium nearly doubled its number of annual visitors and attracted far more donors in its new home, its projected revenues for the new location proved to be overly optimistic. In

planning its opening, the Exploratorium looked to learn from the experience of another cultural museum in San Francisco, the California Academy of Sciences. The Academy offered free admission when it unveiled its new facility in 2008, opening to almost 17,000 visitors including many waiting in a line over a mile long.⁵ Anticipating a similar spike in visitors and wary of being unprepared for large crowds, the Exploratorium inflated its attendance projections beyond the conservative figures estimated by consultants. To match these projected attendance rates, the Exploratorium expanded its revenue and expense budgets and hired additional front-of-house staff. To prevent overcrowding, the organization minimized marketing to promote the new location to the public, and scheduled its opening day on a Wednesday in April, typically a day and month with relatively low numbers of visitors. While the Exploratorium's paid attendance reached about 1.1 million visitors in its first full year at Pier 15,⁶ it had projected an annualized attendance of 2.1 million visitors from April 17 to June 30, 2013, and 1.4 million for the next full year.⁷

Financial problems surfaced in 2013, the year of the move. The operating budget for that year was originally set at \$54 million. Lower than projected attendance and ticket sales,⁸ compounded by a shift in other revenue sources (described in the next section), caused the Exploratorium to fall short of its budget immediately following the move. In response, the Exploratorium reduced its operating budget to \$47 million and laid off a number of employees in an effort to bring expenses in line with revenues.⁹ Though the museum responded quickly to the deficit, it did not have a thorough understanding of the revenue it could consistently expect in the new

Below. The outdoor space at Pier 15 enabled the Exploratorium to create exhibits dealing with new subject matter.



building. By the end of the fiscal year in July 2013, revenues totaled \$43 million, a \$4 million loss.¹⁰

In 2014, the year following move in, the Exploratorium set its operating budget at \$46 million and broke even for the year.¹¹ However, non-operating expenses including \$2 million in severance expenses exceeded revenues. Further cost-cutting action was required; in September 2015, the Exploratorium issued another set of layoff notices.¹²

SHIFTING REVENUE SOURCES

The Exploratorium's revenue sources grew and shifted during the capital project. Before the project, its revenue came predominantly from three sources: contributions, earned income, and grants.¹³ The cost of construction—ultimately \$218 million—required the Exploratorium to generate new funding sources, with a particular focus on individual donations. Through its capital campaign, the Exploratorium was able to double the size of its board, adding 20 new members, including many Silicon Valley philanthropists with significant personal resources to support the project. “I think even to this day people really credit the Exploratorium as being the first institution to really figure out Silicon Valley and get Silicon Valley philanthropists on the board. Now others are starting to catch up,” said one staff member.

The board reached out to new donors and the community to enlist their support for the Exploratorium. Consequently, the museum increased the number of donors who annually contribute \$1,000 or more from 200 to 4,000 over the course of the capital campaign.¹⁴

Growth in private contributions was part of a major change in the Exploratorium's revenue mix. Prior to the start of construction, the museum raised an average of \$15 million annually from individual donors and foundations—representing 47 percent of total revenue from 2000 to 2009.¹⁵ In the years leading up to the opening, 2010 to 2013, private contributions grew to an average of \$40 million per year, comprising 76 percent of total revenue.

In the campaign and post-move period, the Exploratorium was also adjusting to dramatically decreased funding from the National Science Foundation (NSF). The museum received an annual average of \$7.7 million in NSF funding per year from 2000 to 2006, with this number dropping to an annual average of \$3.9 million for the years 2007 through 2014.¹⁶

Ticket sales represented another vital revenue stream. Whereas admissions revenue at the Palace averaged \$5.3 million annually from 2000 to 2013,¹⁷ this revenue source approximately doubled to \$11.4 million at Pier 15 during the fiscal year ending June 30, 2014.¹⁸

A new dependence on attracting visitors, in addition to pursuing individual donors and foundations, fundamentally changed the

business model and priorities of the Exploratorium. One board member characterized the capital project as a pivotal moment in the museum's financial strategy:

Without a big project like this—[one] that was visible and had some civic pride associated with it and so forth—we wouldn't have had the opportunity to tell the story of the Exploratorium to the philanthropic community of San Francisco.

With only one year of post-move financial statements available at the time of this study, Exploratorium leaders were actively examining whether and how this evolved revenue mix would be sustained.^{iv}

Conclusion

The Exploratorium's capital project—executed under budget and on schedule in spite of complicated circumstances—represents both success and surprise. The accessibility of its new location, coupled with targeted programming in expanded exhibit space, helped the Exploratorium introduce new and diverse audiences to its exhibits while attracting new donors. The Exploratorium's appeal also helped boost neighboring development along San Francisco's waterfront.

This case also shows how a building can change an organization—leading to important shifts in operations as well as sources of revenue, and transforming its business model. Many of these changes resulted from overly optimistic projections and unanticipated implications of the Exploratorium's move to a new facility. This museum's experience demonstrates an important reality in planning for opening a new facility: as one staff member said, opening day “isn't your last day—it's your first day.”

^{iv} *The latest consolidated financial report reviewed for this study was for the fiscal year ending June 30, 2014.*

Lessons from the Exploratorium

Combine inside knowledge with outside expertise.

A well-structured team navigates complexity: Four parties managed the Exploratorium's capital project. Two were internal (the Board Building Committee and the Staff Building Committee) and two were external (a developer and a project manager/owner's representative). The capital project director—a crucial role—facilitated clear accountability and communication among all parties. This fixed-term position at the Exploratorium aggregated information from all parties and advocated for the Exploratorium's interests and vision. Having the necessary people on the project, both in terms of number and knowledge, allowed the Exploratorium to coordinate the many moving parts of the process, from fundraising to materials procurement to design, and to respond effectively to issues as they arose.

An engaged board contributes in multiple ways: The Exploratorium leveraged the capital campaign to grow its board of directors significantly. Throughout the course of the capital campaign, the board went from 20 to 40 members, many of whom were philanthropists whose contributions and contacts proved important to meeting a large fundraising goal. The board contributed 75 percent of the capital campaign funding as well as expertise needed to conduct the capital project. Several individual directors played key roles on the Board Building Committee, including leaders with significant experience in finance, construction, engineering, and marine dredging; these board members helped the Exploratorium complete a multi-faceted and challenging building project under budget.

Be ready for organizational change.

The built environment affects work culture: The Exploratorium greatly expanded its exhibit area through a new facility, allowing for a more varied collection of exhibits in both size and subject matter. While outdoor spaces added creative opportunities, complex internal building systems—including radiant heating in floor panels, and the historic status of the building's original walls—necessitated new exhibit development protocols. Staff needed to request approval prior to designing and installing exhibits, and some felt that this impeded the museum's do-it-yourself ethos. Exploratorium leadership, on the other hand, described this issue as one physical manifestation of a much broader change taking place throughout the organization. In their view the museum's move to the new facility was symbolic of its maturation as an institution. As the organization scaled up and entered a new stage in its lifecycle, leaders felt it needed to shift its culture and adopt new ways of working—becoming more strategic about goal setting, more deliberate about planning, and more systematic about process.

Lessons from the Exploratorium

See financial realities beyond opening day.

Income projections must align with expanded operations: The Exploratorium's capital project was dramatic in scale, as well as effect. With the move from the Palace to its new home on Pier 15, the museum more than doubled its programmable square-footage, added about 140 staff members, and increased its total annual revenue significantly. The organization planned for additional staff, exhibits, programs, and attendance—and while its number of annual visitors nearly doubled following the move, the growth in attendance and ticket sale revenue fell short of an overly optimistic forecast. In tandem with other shifts in revenue sources, the Exploratorium experienced an income shortfall against increased operating and maintenance expenses in the new facility. Leaders took action to adapt to this situation, resulting in layoffs that were painful for all staff and generated negative media coverage. As of 2015, the museum continued to address growing pains related to its scale change. As one executive staff member said, "Most of all, if I had any advice for others . . . it's that the world doesn't end on your opening day; it just begins, and you've got to worry about Day Two."

End Notes

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14. Ibid.
15. The Exploratorium consolidated financial reports June 30, 2000—2009.
16. The Exploratorium consolidated financial reports June 30, 2007—2014.
17. The Exploratorium consolidated financial reports June 30, 2000—2013.
18. The Exploratorium consolidated financial reports June 30, 2014.

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