Museum Technology Scan

Fall 2016

Minnesota Children's Museum

INSTITUTE of Museum and Library SERVICES

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Document Contents

Project Approach & Purpose

Purpose: Offer input and inspiration into the museum's parent education, visitor experience, and technology priorities via a landscape analysis.

Discovery → **Landscape Scan** → **Findings & Recommendations**

- *Project objectives and logistics*
- *Stakeholder interviews*
- *Develop areas of focus*

- *Literature review*
- *Phone interviews (5-8)*
- *Background research (10-12 entities)*
- *Trend scan*

- *Compile findings, insights, and trend information*
- *Deliver recos and areas for further consideration*

A Clear Priority

A primary opportunity for the museum is to leverage technology to educate parenting adults with the goal of helping them to recognize, appreciate and support learning through play within the museum walls and beyond.

An important secondary goal is to leverage technology leading practices to optimize visitor experience.

"It's about helping parents connect thinking and doing. The opportunity is to help the parent understand *in this moment* the power of what is happening and what they can do to further that learning."

- Barbara Hahn | VP Learning Innovation | Minnesota Children's Museum

Technology Landscape

Definitions to ensure understanding of the landscape analysis

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The Tech Landscape

stationary display

- large displays
- kiosks/ fixed tablets
- touchscreen tables

location awareness

- RFID
- QR codes
- NFC
- beacons
- GPS

portable device

- smart objects
- loaner screens
- visitor devices
- audio handsets

content platform

- native mobile app
- website
- SMS
- email
- social media

VR

- augmented reality
- virtual reality

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location awareness

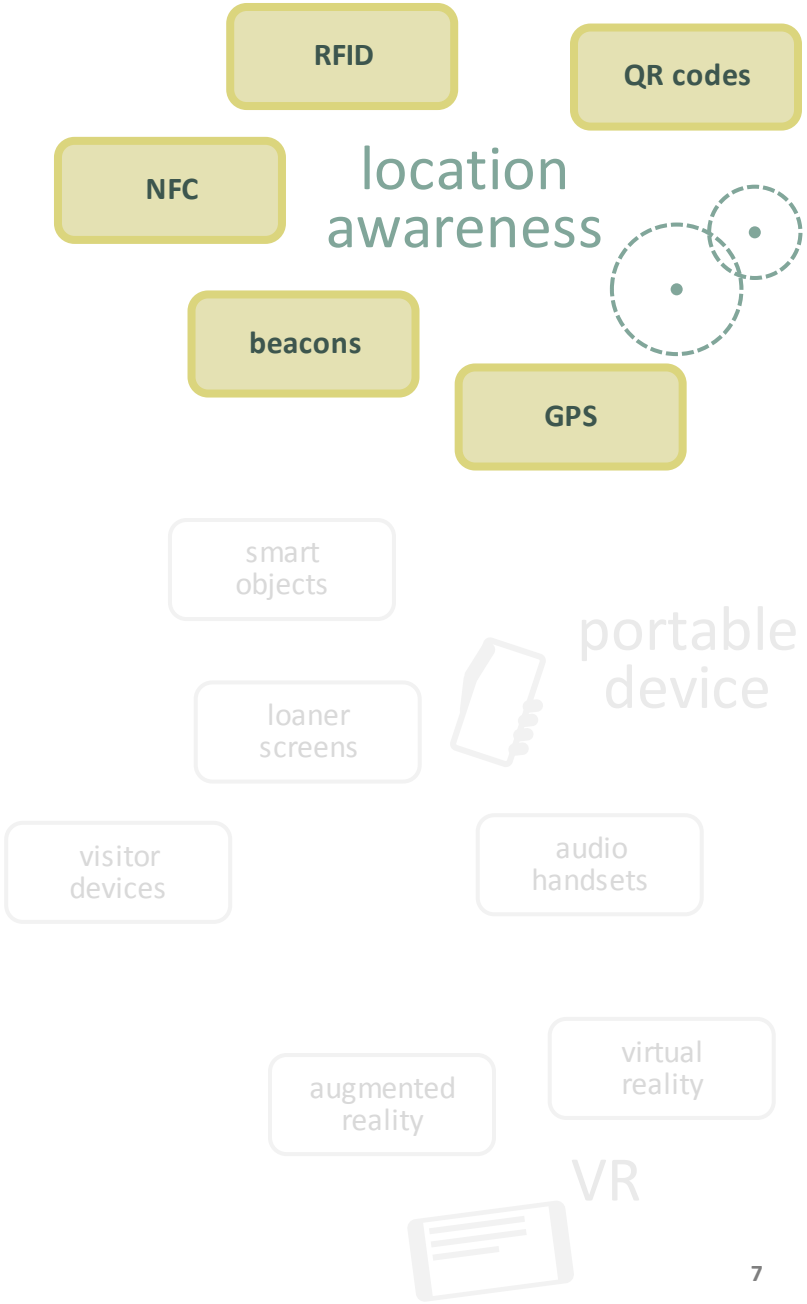
Beacons broadcast messages using Bluetooth that can be picked up by devices in range. Receiving these messages requires a specific app, though this may change over time: Google reports it is building this capability into its Chrome for Android browser.

NFC is a subset of RFID and is increasingly common on phones to support use cases like contactless payments. Penetration on phones is estimated to be 64% by 2018. Range is commonly reported as 20 cm.

Museums use longer-range **RFID** tags to track the location of objects in their collections but most consumer devices will not pick up signals from these tags.

GPS data from a phone can be incorporated into applications, though low resolution and thick walls make it less useful indoors.

QR codes embed information, such as a URL, in a scannable 2D graphic. Adoption and use of these is low.



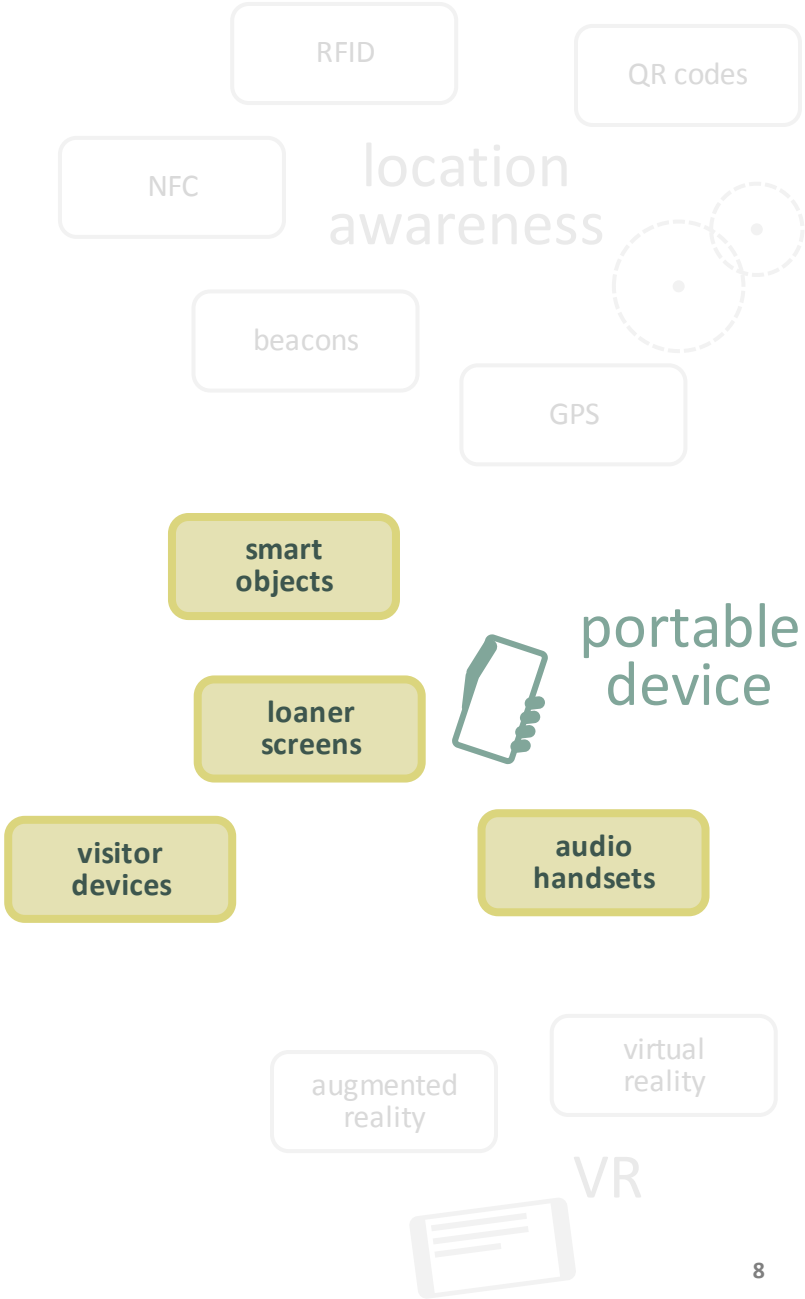
portable device

Visitor devices—phones and tablets—are the target of the "BYOD" approach, and aim to take advantage of the high penetration and familiarity of these devices for their users. People commonly use these devices in museum settings, though most often not for tasks related to their visit.

Loaner screens are consumer devices that visitors may use during their visit. These can bridge the gap for people who don't visit with appropriate hardware, or eliminate the need for visitors to install a specific app on their phones.

Smart objects know something about their environment or their status and tie the physical world and the digital together. They may be used to track environmental conditions, location, purchases, or most anything else.

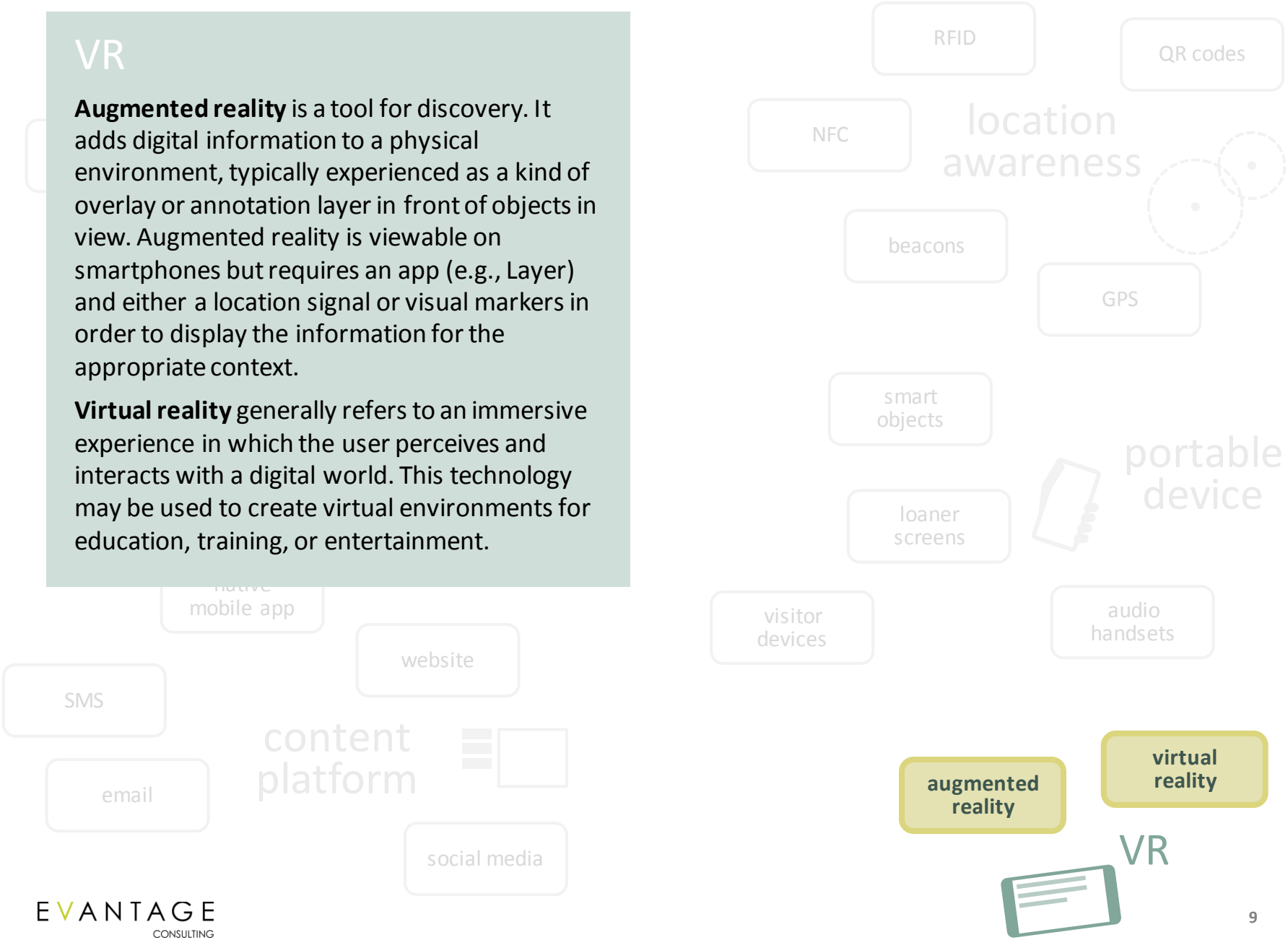
Audio handsets have been in use for years to provide narration for self-guided tours.



VR

Augmented reality is a tool for discovery. It adds digital information to a physical environment, typically experienced as a kind of overlay or annotation layer in front of objects in view. Augmented reality is viewable on smartphones but requires an app (e.g., Layer) and either a location signal or visual markers in order to display the information for the appropriate context.

Virtual reality generally refers to an immersive experience in which the user perceives and interacts with a digital world. This technology may be used to create virtual environments for education, training, or entertainment.



stationary display

large displays

kiosks/ fixed tablets

touchscreen tables

stationary display

Kiosks or mounted tablets can be used as digital labels or provide access to interactive apps. Their location provides the context: a particular object or collection, an exhibit, the museum as a whole.

Touchscreen tables are designed to be interactive. These are often integrated into exhibits and encourage visitors to explore a topic in more depth, interact with digital representations of objects, or run simulations.

Large displays are digital signs. They may present anything that can be formatted for a large screen: interpretive text, video, aggregated social media content, event schedules, café specials, etc.

native mobile app

website

SMS

content platform

email

social media

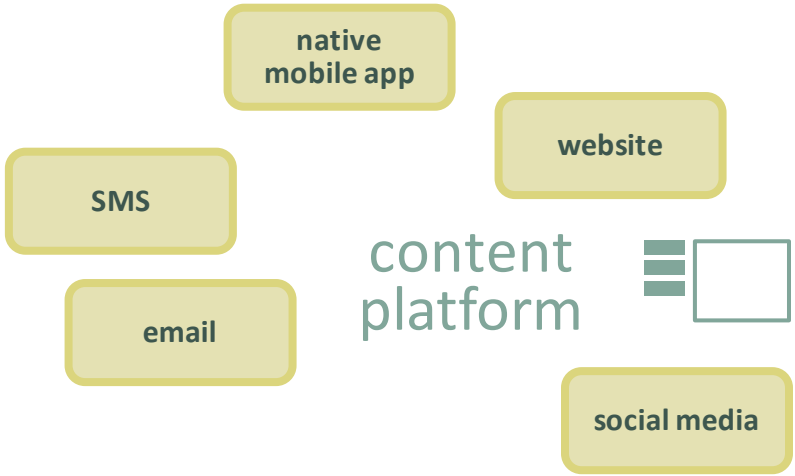
devices

handsets

augmented reality

virtual reality

VR



content platform

Native mobile apps offer access to a device's full range of capabilities, such as location tracking and notifications. However, apps must be downloaded before use, and a user must give an app explicit permission to use location services and other capabilities.

Websites are less robust and seamless on mobile phones than are native apps, but don't need to be installed. Websites designed responsively can also offer similar content and capabilities to mobile and desktop users.

Social media provides an easy framework for interaction between museums and visitors, but functionality and content formatting is constrained by the platform.

SMS is very common and can be a simple way for a visitor to take an action or express an intent without having installed an app .

Email is a common communication mode but appears not to be in widespread use for visitors in the museum.

Native App VS Web-Based App

Native App

+ Leverages device functions, i.e.: GPS, Bluetooth, motion sensors = (location awareness), camera = (AR/VR), virtual wallet = (transactions), and text = (alerts)
+ Limited need for Wi-Fi
- Requires compelling value proposition to download, and internet access to do so
- Requires development for multiple mobile OS platforms

Web App

+ Does not require development of app, in addition to responsive site
+ Ease of updating content and functions
+ No requirement to download
- Limited ability to leverage device functions to enhance experience
- Requires high speed Wi-Fi; especially for video viewing

Museum Interviews

Center for the Future of Museums (CFM)

Children's Museum of Denver

Children's Museum of Houston

Crystal Bridges Museum of American Art

Minneapolis Institute of Art

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Decision criteria for use of technology

We want to offer exhibits that afford a high degree of variability that is under the control of the user. We present information in variety of ways because visitors have different learning styles and inclinations for using technology. (Crystal Bridges / Denver)

Our audience is very early childhood so we take a conservative approach since the AAP recommends no screen time for toddlers. Our decision to use technology is filtered by our ability to achieve identified outcomes around adult/child interactions, experiences that offer an enhanced disposition to learning, and excludes passive viewing. (Denver)

The hands-on museum experience is sacrosanct. If technology pulls away the visitor from hands-on or if it separates the family in terms of communications and shared learning, then we say no. We are looking for tools that deepen the experience and communication. (Houston)

Loaner tablets can be outdated so quickly, so aiming for apps and BYOD. (Houston - note: offer free Wi-Fi).

Decision criteria for use of technology

We chose to invest primarily in an open-source, responsive approach instead of apps to more easily share content generated by 40+ authors across properties and limit dependence on external developers or agencies. Ubiquitous museum Wi-Fi supports BYOD and tethered or loaner screens. (Minneapolis Institute of Arts)

Perspectives from the Center for the Future of Museums

Priority should be about preferences for how visitor want to engage with museums, rather than looking at what technology is hot.

There is a trend of visitors seeking more personalized and tailored experiences, not just one set of information. For example, geo-specific information lets them visit not in a linear sense, but organically as they move through the museum.

Successful uses of technology

Apps considered to be successful, although visitors actively downloading app is a bit of a barrier. (Crystal Bridges- note: support free Wi-Fi)

Interactive kiosks went along with the app, but were not as successful because almost too much content to consume while at the exhibition. (Crystal Bridges)

Our app is also avail via a kiosk and tablet in the museum. When visitors choose to opt in, it gives them another layer of access to exhibits. (Houston)

We use iPads a lot; museum staff like them because they are easy to mount, sturdy, and visitors understand how to use them. (Crystal Bridges)

Large screens (mirroring the iPad that kids are using) and interactive tables allow for good interaction (phone harder to gather round). (Houston)

We use RFID wearables as part of a secret mission game that lets kids know that "I found the right thing." It's a paid experience; visitors can keep the equipment. (Houston)

Visitor adoption

Don't necessarily have a pure BYOD agenda since not all visitors have the right devices or are comfortable with use of technology. (Crystal Bridges)

Visitors say they want to use an app during, before, and after visits. We are still in the summative evaluation phase, but early observations tell us there is less use of the app in active areas of the museum, versus non-active exhibit areas. (Houston)

AR has potential, but we have some concerns about visitors looking through a screen while experiencing the exhibit. (Houston) Note: see AR/VR notes from Center for Future of Museums

We will choose to use tech if want to have a social media component to the exhibit. Use of hashtags seem to be readily adopted. (Crystal Bridges)

We don't force users to agree to terms and conditions for using the sponsored Wi-Fi. Based on survey data (can't get intelligence from current Wi-Fi) about 70% of users have smartphones in the museum. We promote our tools through social media, in-museum signage and "digital ambassador" staff. (Minneapolis Institute of Arts)

Technology being tested or of future interest

In our outdoor space, we are testing beacons to send an alert you are near an interesting thing on a trail. We are interested in location awareness so information is there when the visitors needs it. (Crystal Bridges)

We are interested in augmented and virtual reality, as long as it does not disrupt interaction with the art. We like the idea of bringing to life the scene they are looking at. (Crystal Bridges)

We are testing wearables with accelerometers to measure activity in our outdoor space (heart rate, steps, change in acceleration). We are then surveying parents about their perceptions of the level of their child's activities. We plan to compare parent responses to the actual data from the wearables. Data collection ended June 1, so do not yet have results. (Denver)

Wearables and smart objects have promise, but maintenance has to be considered in terms of staff and cost. (Houston)

Technology being tested or of future interest

We are about to launch a new iOS app called "Journeys" that will allow users to select a guided tour and be led through the museum using an indoor mapping of the space (done by Apple). A native iOS app was selected instead of a responsive approach to utilize the location and accelerometer functions. (Minneapolis Institute of Arts)

Perspectives from the Center for the Future of Museums

Lots of museums are experimenting with location-awareness, but no consensus on what technology works best.

Boston Science Museum is testing a new location awareness technology called ByteLight. Every ByteLight enabled LED bulb contains a chip that flashes a light signal that can be picked up by an iPad camera. While the signal flashes at a rate too fast for human eyes to see, the technology allows your mobile device to track your location to within a meter of accuracy. Not dependent on signal coverage and relatively cheap.

Technology being tested or of future interest

Perspectives from the Center for the Future of Museums (continued)

CogniToys, are Wi-Fi-enabled, educational smart toy Dinosaurs that learn and grow with children. Loaded with fun personalities and tons of information, the curious and conversational Dinos are powered by IBM Watson and Elemental Path's Friendgine technology, allowing them to deliver a personalized play and learning experience.

Augmented and Virtual Reality

Visitors want information layered over the real world or what they are seeing

Most current activity is to use VR to simulate immersive environments, (e.g.: Edinborough Center Museum) simulating extinct animals swimming around you.

Problem with Google Cardboard and lower cost VR is that it's an isolating experience.

Oculus Rift can facilitate a shared experience, but very expensive at present.

Technology being tested or of future interest

Perspectives from the Center for the Future of Museums (continued)

Mixed Reality- the best of both worlds

Virtual reality overlaid on the real world is called mixed reality, or MR. (The goggles are semitransparent, allowing you to see your actual surroundings.)

Magic Leap and other companies are currently in development of mixed reality technologies that could be applied to museums.

Microsoft HoloLens could become the "sweet spot of museum engagement." It could allow visitors to see, handle, manipulate, and share digital doubles of real objects, or share the attentions of a docent avatar.

Insights about partnerships

Children's Museum of Denver and VROOM

State of Colorado decided to "pilot" Vroom using the museum, so no cost.

Phase 1: Interaction cues and content in non-exhibit spaces, like bathrooms, parking, elevator, stairways, etc. ("amenity spaces").

Designing wall graphics and signage to deliver the messaging; not yet implemented.

State of CO has engaged an external evaluation partner to measure future results, but they have not yet determined metrics.

Future phase: possibility of generic content around "VROOM at the museum" to be included in the content VROOM generally distributes through their platform.

Insights about partnerships

Children's Museum of Houston and 21-Tech

21-Tech trained museum staff to use 3rd party learning apps as way of facilitating learning and exploration in the exhibit.

Ideally, kids are getting a little bit of information and guidance, and then can do it themselves in reality.

One challenge can be that kids want to play with iPad and control it.

Insights about partnerships

Other

Denver is partnering with Bright by 3, a text messaging platform already reaching parents of young kids, as a content provider of tips about interactions and use of everyday items for play, (note: no call-to-action about the museum).

Even though Houston has a responsive web site, they decided to do separate app because if was funded by a development partner as part of their intern project.

Houston has partnered with Apple to overlay their museum map on Apple maps to know where you are in museum.

Setting Context:
5 trends & observations

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5 Trends & Observations

1. BYOD is a consumer behavior trend that could be the key driver of museums choosing mobile apps as their predominant technology solution

2. Many museums are now offering free (or sponsored) Wi-Fi, as well as device charging stations to accommodate BYOD learning experiences

3. There is growing consumer expectation for delivering contextual content:
   - interactive kiosk and large displays traditionally used
   - location awareness technology is next evolution

4. Millennial adults with young children have a strong desire for social media sharing and is an important consideration

5. Allowing visitors to explore emerging technology during their museum visit, (e.g.: augmented or virtual reality) could be part of a learning experience

Average of 58% smartphone penetration with lower socio-economic segments in the U.S.

Demographics of Tech Device Ownership

based on surveys of 2,001 US adults aged 18+ (smartphone data) and 1,907 adults

November 2015

Among US adults, the % who own a:	Smartphone	Tablet	Computer	Game console	MP3 player
Total	68%	45%	73%	40%	40%
Men	70%	43%	74%	37%	38%
Women	66%	47%	71%	42%	42%
White, Non-Hispanic	66%	47%	79%	39%	41%
Black, non-Hispanic (n=85)	68%	38%	45%	43%	34%
Hispanic	64%	35%	63%	45%	40%
18-29	86%	50%	78%	56%	51%
30-49	83%	57%	81%	55%	51%
50-64	58%	37%	70%	30%	37%
65+	30%	32%	55%	8%	13%
Less than high school	41%	28%	29%	21%	21%
High school	56%	44%	63%	35%	25%
Some college	75%	51%	81%	54%	47%
College+	81%	67%	90%	37%	56%
Less than $30k/year	52%	19%	50%	33%	26%
$30-50k	69%	35%	80%	43%	43%
$50-75k	76%	49%	90%	50%	46%
$75k+	87%	62%	91%	54%	63%
Urban	72%	42%	67%	41%	42%
Suburban	70%	50%	78%	41%	42%
Rural	52%	37%	67%	34%	30%

MarketingCharts.com | Data Source: Pew Research Center's Internet & American Life Project

(Note: no specific data found for Smolian and Hmong US residents)

Collection Based Museums

Brooklyn Museum of Art

Cooper Hewitt

Corning Museum of Glass

Crystal Bridges Museum of American Art

Minneapolis Institute of Art

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Technology Reviews Approach

Technology-enabled experiences within the museums and non-museum venues were rated (1 low - 5 high) based on their alignment to MCM goals:

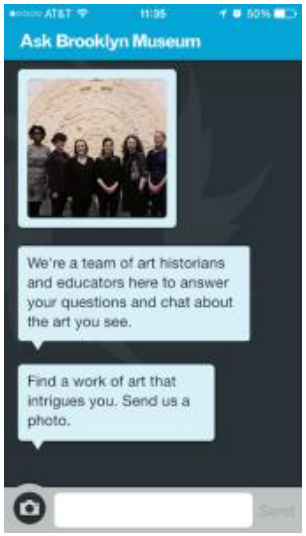
- Connects Exhibit to Learning Agenda
- Enhances Non-Exhibit Visit Experience
- Low Disruption to Child Interaction
- Creates Out-Of-Museum Continuity of Learning
- Provides Ease of Use (Technology Accessibility)

Technologies used in the example experiences were also highlighted:

Stationary Display	large	tables	kiosk		
Content Platform	website	native app	sms	email	social
Portable Device	smart objects	loaner screens	visitor device	handsets	
Virtual Reality	augmented	VR headset			
Location Awareness	beacons	NFC	RFID	QR codes	GPS

Brooklyn Museum of Art – Collections Based

ASK App



Summary

- "ASK is the newest iOS app developed by the Brooklyn Museum to allow visitors to ask questions during their museum visit.
- Audience Engagement staff on the other end answering questions live via the text-messaging feature of the app.
- Audience Engagement staff knows where the visitor is located based on iBeacons that the museum has installed throughout the galleries.

Primary Audience(s)

- All museum visitors

Stationary Display	large	tables	kiosk		
Content Platform	website	native app	sms	email	social
Portable Device	smart objects	loaner screens	visitor device	handsets	
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Alignment to MCM Objectives

Connects Exhibit to Learning Agenda

Enhances Non-Exhibit Experience

Low Disruption to Child Interaction

Creates Out-Of-Museum Continuity

Provides Ease of Use (Accessibility)

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Cooper Hewitt – Collections Based

Digital Pen

Summary

- At the Smithsonian's Museum of Design, the Cooper-Hewitt, visitors are given a digital pen along with their ticket.
- The pen enables users to easily save a digital copy of items by touching labels throughout the museum. Users can then access those items through a URL on the back of their ticket. Items can also be shared with your friends via email.
- According to the Observer, from August 2015 to February 2016, an estimated 20 % of the pen's users returned to the Cooper-Hewitt website to check out what they'd collected, and 99% of the museum's 74,265 visitors accepted the pen when offered.

Primary Audience(s)

- Visitors

Stationary Display	large	**tables**	kiosk		
Content Platform	website	native app	sms	email	social
Portable Device	**smart objects**	loaner screens	visitor device	handsets	
Virtual Reality	augmented	VR headset			
Location Awareness	beacons	**NFC**	RFID	QR codes	GPS

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Alignment to MCM Objectives

Connects Exhibit to Learning Agenda

Enhances Non-Exhibit Experience

Low Disruption to Child Interaction

Creates Out-Of-Museum Continuity

Provides Ease of Use (Accessibility)

Corning Museum of Glass – Collections Based

GlassApp (mobile web)

Summary

- GlassApp launched with the opening of the Contemporary Art + Design Wing in March 2015 as a BYOD program; facilitated by free Wi-Fi and mobile charging stations.
- Featuring information on 70+ contemporary works of art, GlassApp includes videos, artist bios and photos to enhance the visitor experience by highlighting current conversations in art, craft and design.
- iPads mounted on gallery benches and a multi-touch table provide visitors access to the BYOD program content in a larger format, and encourage users to continue the experience on their own devices.
- Visitors can share experiences using #GlassApp.

Primary Audience(s)

- All museum visitors

Stationary Display	large	tables	kiosk		
Content Platform	website	native app	sms	email	social
Portable Device	smart objects	loaner screens	visitor device	handsets	
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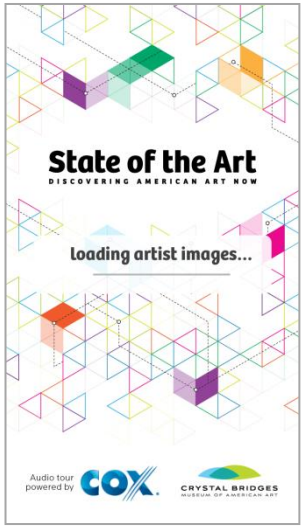
Crystal Bridges Museum of American Art – Collections Based

State of the Art App



Summary

- The State of the Art Digital Experience includes multiple platforms: website, mobile app, digital labels, touch kiosks, YouTube, and iTunes U.
- Featuring a diverse range of working artists from across America, "State of the Art" offers a snapshot of contemporary art that examines the ways in which people innovate with materials old and new to engage deeply with issues relevant to our times.
- The exhibit is traveling to the Minneapolis Institute of Art, Minneapolis, Minn., February 18 – May 29, 2016.

Primary Audience(s)

- All museum visitors and distance visitors

Stationary Display	large	tables	kiosk		
Content Platform	website	native app	sms	email	social
Portable Device	smart objects	loaner screens	visitor device	handsets	
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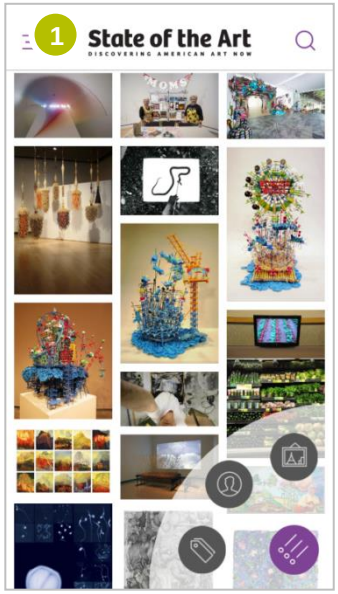
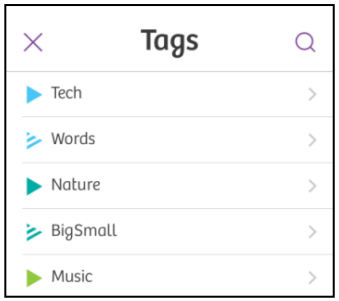
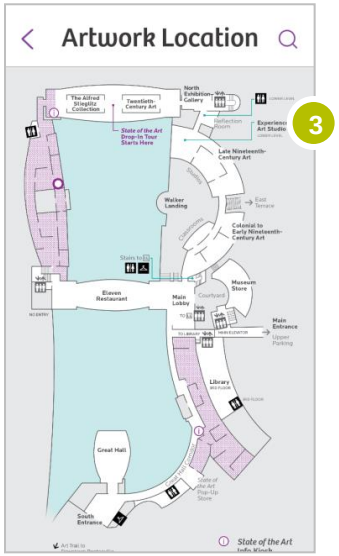
Crystal Bridges Museum of American Art – Collections Based

State of the Art App







1. Thumbnail gallery offers a preview of available gallery pieces. Overlay menu present additional sorting options for Artwork, Artists, and topical Tags

2. Artwork detail content extends content to include piece detail including artist info and supplemental video content.

3. Maps of location of artwork within the museum. Locations on the maps are specific to the artwork but the map is not interactive.

Note: the State of the Art app has not been updated for traveling exhibit in Minneapolis.

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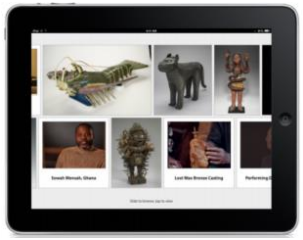
Minneapolis Institute of Art – Collections Based

Art Stories



Generous support for wi-fi provided by:

THOMSON REUTERS

Summary

- ArtStories is a web application that invites users of all ages and abilities to engage in "ArtStories". Audiences can explore galleries within museum using an iPad made available in the galleries or using their own devices. Users can further explore from outside the museum
- MIA has focused on responsive web applications rather than building native apps.
- Free Wi-Fi is provided by Thompson Reuters which allows users to experience the digital experiences using their own devices.

Primary Audience(s)

- Museum visitors and distance visitors

Stationary Display	large	tables	kiosk		
Content Platform	**website**	native app	sms	email	**social**
Portable Device	smart objects	**loaner screens**	**visitor device**	handsets	
Virtual Reality	augmented	VR headset			
Location Awareness	beacons	NFC	RFID	QR codes	GPS

Alignment to MCM Objectives

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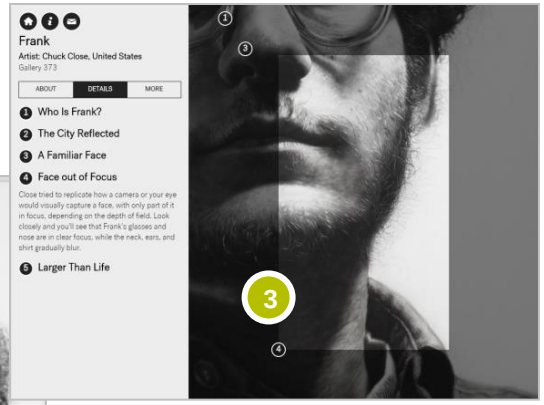
Minneapolis Institute of Art – Collections Based

Art Stories (Griot)



artstories.artsmia.org

http://mw2015.museumsandtheweb.com/

1. Users select specific artwork from a gallery of thumbnail images. The layout grid responds to different screen sizes, making it easy to scroll or swipe.
2. Additional supplemental content is shown along with a gallery number and map snippet to show the location within the museum. Note: this map snippet is not interactive like the interactive gallery map.
3. Focal points outlined with overlays allow users to zoom into the artwork detail including additional explanation.
4. It's available on iPads in the museum's galleries, and it's also optimized for a smartphone or computer

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Minneapolis Institute of Art – Collections Based

Interactive Touchscreen Map

http://www.slideshare.net/dhegley/the-dream-the-team-the-results

Summary

- Large-scale, multi-touch screen that enables groups to engage in social interactions and shared learning experiences. The map uses geography as the basis for illustrating connections between cultures over time.
- Giant touchscreen to attract and engage visitors to explore additional content. This map of Africa lets users tap to reveal photos and additional context on everything from ivory carving to dancing to the slave trade.
- Technology does not detract from the artwork and users extended their stay in the exhibit based on MIA's "African Galleries Reinstall: TDX Evaluation".

Primary Audience(s)

- Museum visitors

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Experiential Museums

9/11 Memorial Museum

Boston Children's Museum

Canadian Museum of Civilization

Chicago Field Museum

Children's Museum of Denver

Children's Museum of Houston

Children's Museum of Indianapolis

Fondation Louis Vuitton

KidsQuest Museum Bellevue

Magic House (St. Louis)

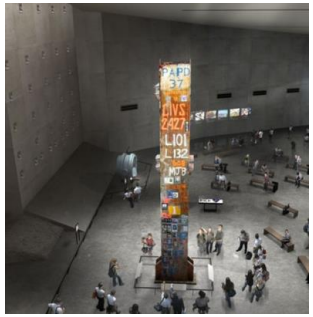
The Tech Museum of Innovation

Other Notable Technologies

EVANTAGE CONSULTING

9/11 Memorial – Non-Museum Experiential

Digital Exploration of Artifacts



Summary

- The Museum tells the story of 9/11 through a merging of interactive technology, archives, narratives and a collection of physical artifacts.
- Exhibits take advantage of digital technology such as a giant touchscreen to select and view artifacts, track, aggregate and display news feeds, and provide a digital guestbook.
- Local Projects, a museum design firm, led by Jake Barton worked on the 9/11 Museum technology for eight years, conceptualizing and engineering more than 90 multimedia installations.

Primary Audience(s)

- Memorial visitors

Stationary Display	large	tables	kiosk		
Content Platform	website	native app	sms	email	social
Portable Device	smart objects	loaner screens	visitor device	handsets	
Virtual Reality	augmented	VR headset			
Location Awareness	beacons	NFC	RFID	QR codes	GPS

EVANTAGE CONSULTING

Alignment to MCM Objectives

Connects Exhibit to Learning Agenda

Enhances Non-Exhibit Experience

Low Disruption to Child Interaction

Creates Out-Of-Museum Continuity

Provides Ease of Use (Accessibility)

9/11 Memorial – Non-Museum Experiential

Digital Exploration of Artifacts

https://www.yahoo.com/tech/technology-brought-the-world-the-news-and-90600061439.html#

https://www.youtube.com/watch?v=e9CHVEheqlo

1 **The Last Column**
This was the last and only standing column found in the rubble of the 9/11 aftermath. The remnant stands in the center of the museum's foyer. A touchscreen wall identifies each marking on the column and gives users an opportunity to zoom in and even see the story behind it.

2 **Timescape**
A wall projects 9/11-related topical news: It gathers and aggregates news information from agencies across the globe, updated every night.

3 **Beam Signing**
Visitors hand-write notes onto a touchscreen. The notes appear within 30 seconds, overlaid on a world map projected onto a 24-foot screen.

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Boston Children's Museum – Experiential Museums

The Power of Play

The Power of Play

http://www.bostonchildrensmuseum.org/power-of-play

Summary

- Connects exhibit content on the website with the key learning skills for the child. A section of the website is dedicated to the concept and includes research reports, news articles, videos, and links to external content.
- Play and Learning, Play and Health, Play and Social-Emotional Development, Play and Creativity, and Play and Cultural differences are topics that help support the positive message about play and the science of brain development.
- Additional "Learning Resources" are provided for families and educators on the website including "Race to the Top" (Federal grant program for early learning - multiple libraries and museums in MA).

Primary Audience(s)

- Parents & Educators

Stationary Display	large	tables	kiosk		
Content Platform	**website**	native app	sms	email	social
Portable Device	smart objects	loaner screens	visitor device	handsets	
Virtual Reality	augmented	VR headset			
Location Awareness	beacons	NFC	RFID	QR codes	GPS

EVANTAGE CONSULTING

Alignment to MCM Objectives

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Provides Ease of Use (Accessibility)

Canadian Museum of Civilization – Non-Museum Experiential

App with Audio Guides

Summary

- An interpretive guide featuring audio tours, interactive floor plans.
- Two 40 minute audio tours are featured that provide a glimpse into Canada's fascinating social history and highlight the history and contributions of the country's First Peoples. The audio tours are enhanced with visuals.
- Interactive floor maps help guide visitors through the four levels of this architectural gem.
- A calendar of events provides information on current exhibitions, IMAX© films and other programs. Useful information such as location, hours of operation, admission fees and amenities is also included.

Primary Audience(s)

- All visitors

Stationary Display	large	tables	kiosk		
Content Platform	website	**native app**	sms	email	social
Portable Device	smart objects	loaner screens	**visitor device**	handsets	
Virtual Reality	augmented	VR headset			
Location Awareness	beacons	NFC	RFID	QR codes	GPS

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Provides Ease of Use (Accessibility)

EVANTAGE CONSULTING

Chicago Field Museum of Natural History – Experiential Museums

App with Social Functions

Summary

- App is loaded with exclusive content, experiences, and curated tours and scavenger hunts.
- Allows you to share your favorites with friends.
- Create your own tours of the Chicago science museum based on an interest or theme.
- Through video and audio features, the museum's scientists give visitors a greater insight into featured artifacts and specimens, of which the massive museum has a daunting number.

Primary Audience(s)

- All visitors

Stationary Display	large	tables	kiosk		
Content Platform	website	native app	sms	email	social
Portable Device	smart objects	loaner screens	visitor device	handsets	
Virtual Reality	augmented	VR headset			
Location Awareness	beacons	NFC	RFID	QR codes	GPS

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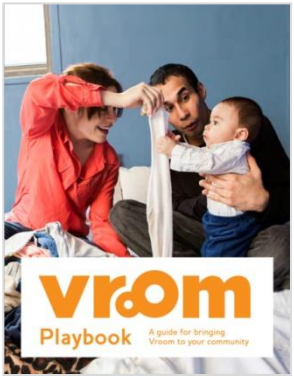
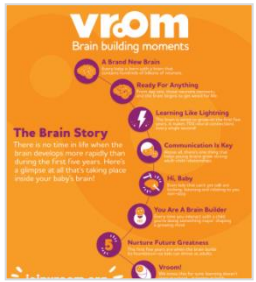
EVANTAGE CONSULTING

Children's Museum of Denver – Experiential Museums

Upcoming Vroom Partnership





Summary

- Upcoming partnership with Vroom where they intend to include activities around the building such as count the stairs with your child.
- Vroom is a program set up by the Bezos Family Foundation that promotes early learning through tools and resources geared toward helping promote brain development (focused on birth – 5 years old).
- Vroom posts tips and brain building activities through a number of online social channels such as Facebook, Twitter, Pinterest and Instagram.
- Additional printable resources such as posters, flyers, and handouts are also available.

Primary Audience(s)

- Museum visitors and community

Stationary Display	large	tables	kiosk		
Content Platform	website	native app	sms	email	social
Portable Device	smart objects	loaner screens	visitor device	handsets	
Virtual Reality	augmented	VR headset			
Location Awareness	beacons	NFC	RFID	QR codes	GPS

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Children's Museum of Houston – Experiential Museums

Extend Exhibits with MoreCMH

Summary

- MoreCMH is an iOS app designed to enhance visitor interaction with exhibits throughout the museum by extending content and offering supplemental activities.
- Users can choose activities in direct support of exhibits such as "What Do I Do?" and finding answers to "Big Questions" to exploring our "What Happens If?" challenges and finding great things to "Do At Home!"
- The app was developed with Pariveda Solutions and major funding provided by Institute of Museum and Library Services

Primary Audience(s)

- Museum visitors (child & parent)

Stationary Display	large	tables	kiosk		
Content Platform	website	**native app**	sms	email	**social**
Portable Device	smart objects	loaner screens	**visitor device**	handsets	
Virtual Reality	augmented	VR headset			
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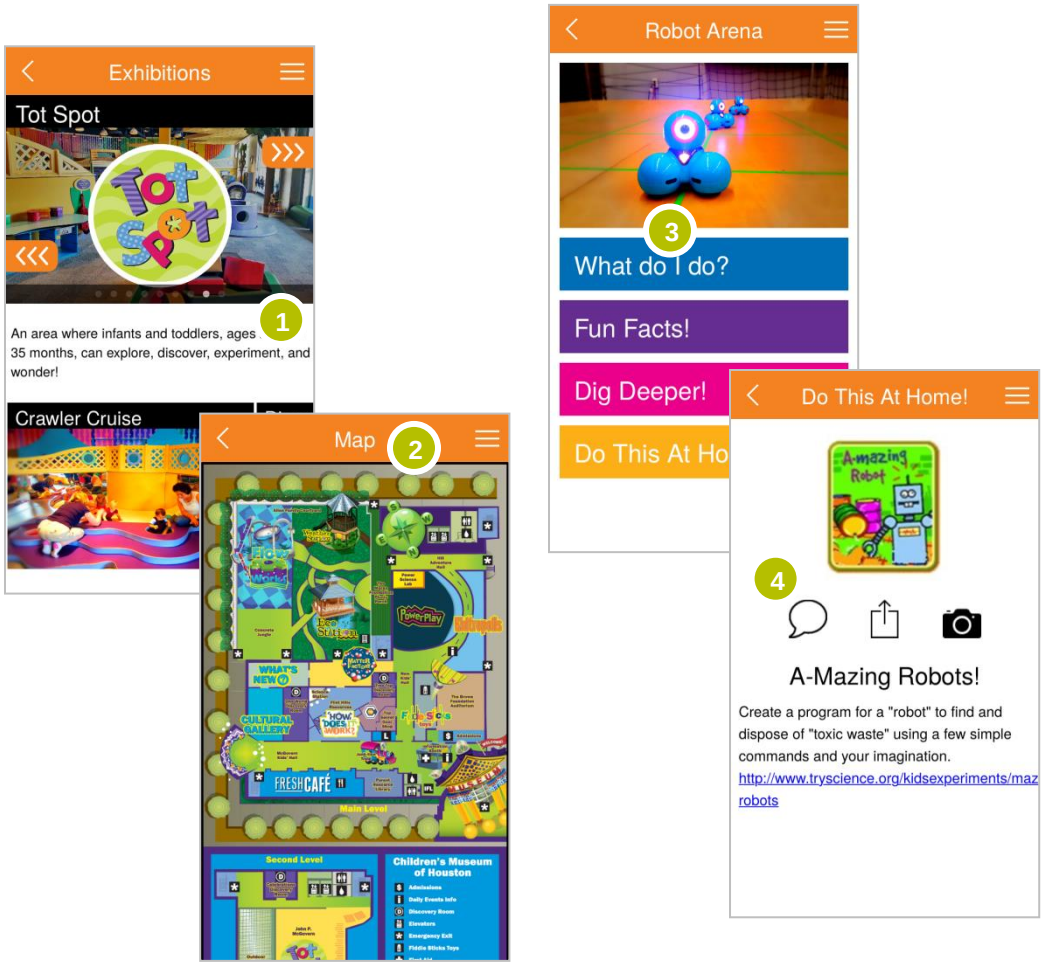
Children's Museum of Houston – Experiential Museums

Extend Exhibits with MoreCMH



1. Exhibitions are highlighted along with specific activities. Users can filter and customize listings by age group.
2. Exhibit map is easily accessed but is not dynamic based on the exhibit being viewed.
3. Exhibit content is expanded with instruction for the exhibit and "Fun Facts!" and "Dig Deeper!" content to enhance the in-museum experience. Additional suggestions for "Do This At Home!" extend to exhibit concepts to in home exploration.
4. Photo capture and submitting comments allow visitors to share their experience.
5. Links to other external resources such as National Geographic and Try Science expand ideas and content beyond the museum.

EVANTAGE CONSULTING

Children's Museum of Indianapolis – Experiential Museums

Exhibit-Related Apps

Summary

- Six apps that relate to hands-on museum exhibits, including Playscape, (Playscape app); Power of Children, (Choose Your Path app); and Take Me There: China (Become a Warrior app).
- The apps feature activities that correspond to elements the child/student will experience in hands-on museum exhibits, even if they can't visit.
- During a visit to the exhibit, the app will enhance the learning experience and help solidify new skills learned while exploring at the museum.

Primary Audience(s)

- Parents and their children

Stationary Display	large	tables	kiosk		
Content Platform	website	**native app**	sms	email	social
Portable Device	smart objects	loaner screens	**visitor device**	handsets	
Virtual Reality	augmented	VR headset			
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EVANTAGE CONSULTING

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Children's Museum of Indianapolis – Experiential Museums

Exhibit-Related Apps

Summary

- The "What's Your Style?" exhibit allows kids to become inspired by a variety of designs and quirky accessories, like the 1970s Telephone Purse or Gianni Versace's Warhol-inspired suit.
- Students then shared their new look on Instagram using an #OwnThatStyle hashtag. Encourages young teens to be themselves and be proud of who they are.
- Contributions were showcased in a global, dynamic map within the exhibit.
- Also offer a "What's Your Style?" app to mix and match fashions on a digital mannequin.

Primary Audience(s)

- Young teen and children visitors

Stationary Display	large	tables	kiosk		
Content Platform	website	native app	sms	email	social
Portable Device	smart objects	loaner screens	visitor device	handsets	
Virtual Reality	augmented	VR headset			
Location Awareness	beacons	NFC	RFID	QR codes	GPS

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Children's Museum of Indianapolis – Experiential Museums

Google Cardboard Virtual Tour

Summary

- The Children's Museum Virtual Tour is a conceptual Google Cardboard app for iOS and Android that takes users on a self-guided tour of the museum while at home.
- Interactive, virtual hotspots lead users through the exhibits and engage further with additional video, image, and supplemental content.

Primary Audience(s)

- Prospective visitors

Stationary Display	large	tables	kiosk		
Content Platform	website	native app	sms	email	social
Portable Device	smart objects	loaner screens	visitor device	handsets	
Virtual Reality	augmented	VR headset			
Location Awareness	beacons	NFC	RFID	QR codes	GPS

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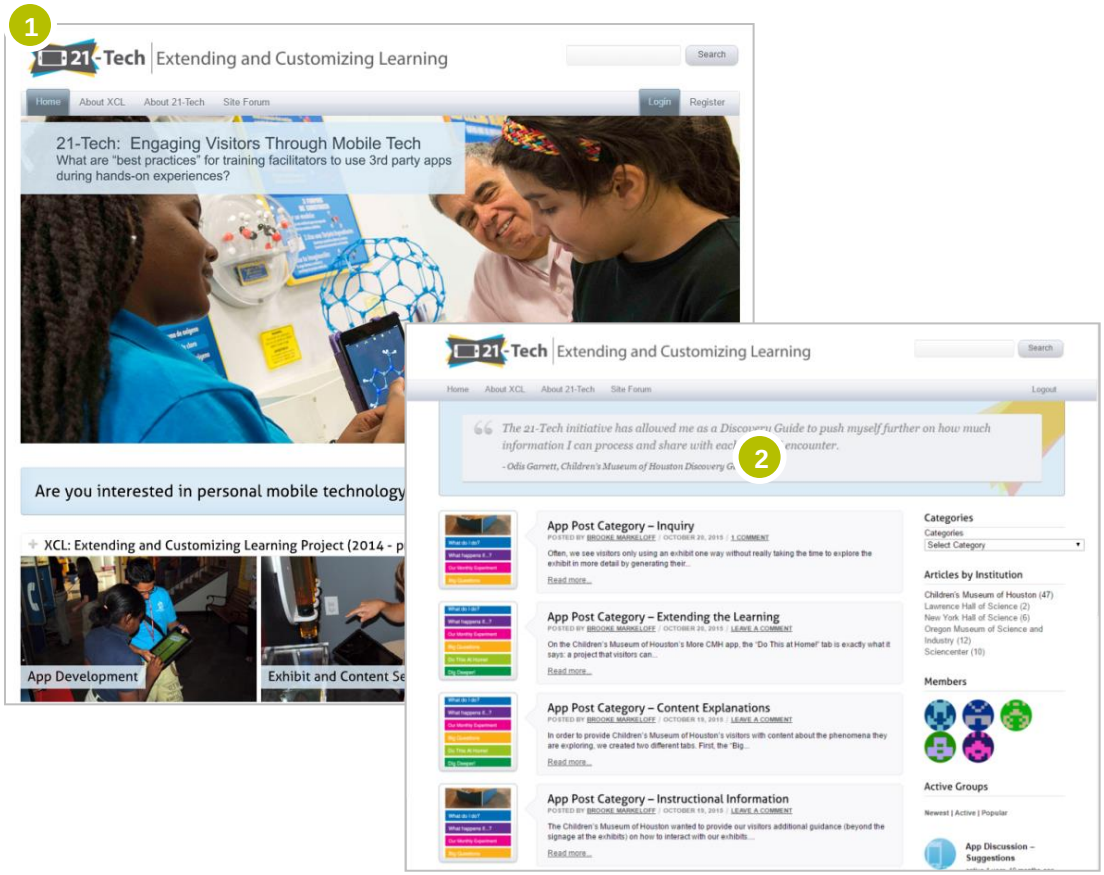
Children's Museum of Houston – Experiential Museums

21-Tech Partnership

> *21-Tech is a bridge between our museum guides and the visitors in that it creates connections between educational concepts and the real world.*
>
> *- Shawn Waxali, Children's Museum of Houston Discovery Guide*



21-tech.org/blog/tag/childrens-museum-of-houston

1. The Children's Museum of Houston partners with 21-Tech to study, explore, and share the effective use of mobile and tablet technology by gallery facilitators (in Houston called Discovery Guides).

   The project primarily supports the use of mobile technologies and information at pre-existing exhibits.

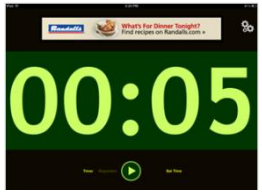
2. 21-Tech has a user forum with articles and discussions by institutions with a wealth of information about the use of technology within CMH or other museums.

EVANTAGE CONSULTING

Children's Museum of Houston – Experiential Museums

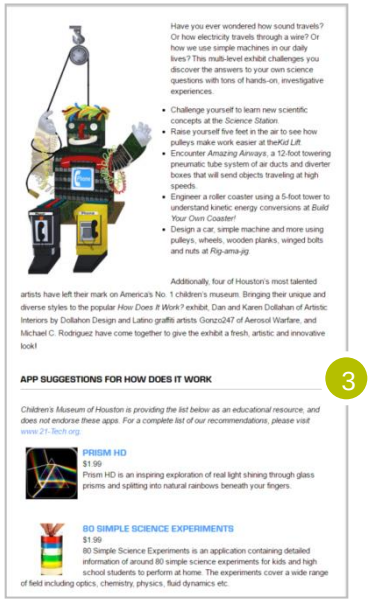
21-Tech Partnership

1 Giant Arch exhibit at CMH



http://www.21-tech.org/wp-content/uploads/2013/04/21Tech-Formative-Evaluation-Phase-II-Brief.ppsx

https://www.youtube.com/watch?v=5W7Nti6jmaI



Have you ever wondered how sound travels? Or how electricity travels through a wire? Or how we use simple machines in our daily lives? This multi-level exhibit challenges you discover the answers to your own science questions with tons of hands-on, investigative experiences.

- Challenge yourself to learn new scientific concepts at the *Science Station*.
- Raise yourself five feet in the air to see how pulleys make work easier at the*Kid Lift*.
- Encounter *Amazing Airways*, a 12-foot towering pneumatic tube system of air ducts and diverter boxes that will send objects traveling at high speeds.
- Engineer a roller coaster using a 5-foot tower to understand kinetic energy conversions at *Build Your Own Coaster!*
- Design a car, simple machine and more using pulleys, wheels, wooden planks, winged bolts and nuts at *Rig-ama-jig*.

Additionally, four of Houston's most talented artists have left their mark on America's No. 1 children's museum. Bringing their unique and diverse styles to the popular *How Does It Work?* exhibit, Dan and Karen Dollahan of Artistic Interiors by Dollahon Design and Latino graffiti artists Gonzo247 of Aerosol Warfare, and Michael C. Rodriguez have come together to give the exhibit a fresh, artistic and innovative look!

APP SUGGESTIONS FOR HOW DOES IT WORK

Children's Museum of Houston is providing the list below as an educational resource, and does not endorse these apps. For a complete list of our recommendations, please visit www.21-Tech.org.

PRISM HD
$1.99
Prism HD is an inspiring exploration of real light shining through glass prisms and splitting into natural rainbows beneath your fingers.

80 SIMPLE SCIENCE EXPERIMENTS
$1.99
80 Simple Science Experiments is an application containing detailed information of around 80 simple science experiments for kids and high school students to perform at home. The experiments cover a wide range of field including optics, chemistry, physics, fluid dynamics etc.

1. Facilitators at CMH used iPad apps "Largest Bridges" and "Giant Timer" with the Giant Arch exhibit

   Additional examples of using apps to supplement learning and increase engagement at CMH from formative evaluation.

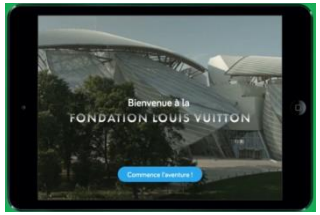
2. Discovery Guides in Houston may use a 3rd party iPad app, such as "World Record Paper Airplanes" to help guide a child through an ad-hoc activity such as building paper airplanes and flying them. This is done without a specific exhibit space.

3. Select exhibit pages on the CMH website highlight suggested apps relating to the exhibit. A full review of suggested apps is available on the 21-Tech website. (http://www.21-tech.org/reviews/)

EVANTAGE CONSULTING

Fondation Louis Vuitton – Experiential Museums

ArchiMoi / Architect App



http://archimoi.fondationlouisvuitton.fr/en/

Summary

- The Fondation Louis Vuitton wants children aged 6 to 12 visiting the new Frank Gehry-designed museum with their families and friends to "look up" at the building and become "apprentice architects".
- The app "ArchiMoi" is focused on architecture to let the parents and/or the guides introduce the artworks to the children.
- Visitors are able to borrow a device from the welcome desk on arrival at no cost.

Primary Audience(s)

- Museum visitors (parents and children)

Stationary Display	large	tables	kiosk		
Content Platform	website	**native app**	sms	email	social
Portable Device	smart objects	**loaner screens**	**visitor device**	handsets	
Virtual Reality	augmented	VR headset			
Location Awareness	beacons	NFC	RFID	QR codes	GPS

EVANTAGE CONSULTING

Alignment to MCM Objectives

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Low Disruption to Child Interaction

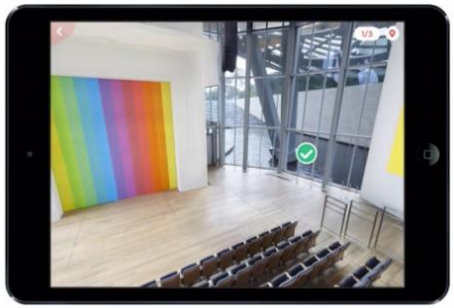
Creates Out-Of-Museum Continuity

Provides Ease of Use (Accessibility)

Fondation Louis Vuitton – Experiential Museums

ArchiMoi / Architect App

1



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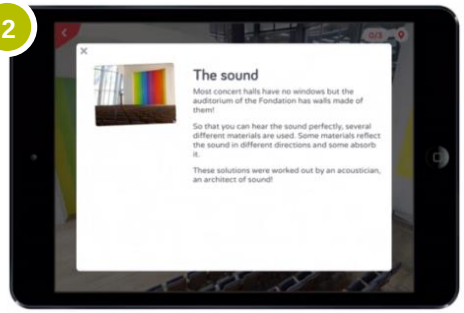

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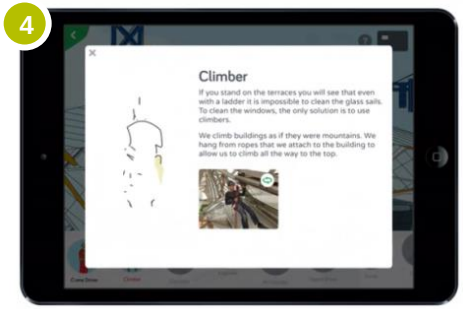

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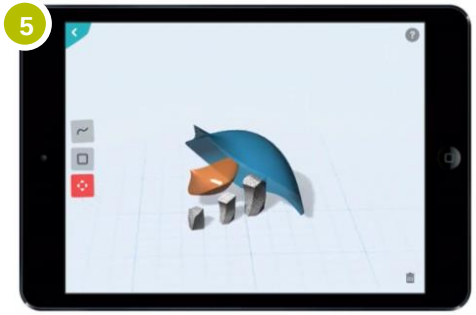


1. Allows child visitors to explore the space with 360 degree views of the museum itself. Four main areas are included for exploration: The Sails, The Terraces, The Canyon and the Auditorium.

2. Interactive selection options reveal more detail about the planning or construction of the area.

3. Sketching options allow kids to express their creativity with pre-set objects that can be manipulated and customized with color and backgrounds. Sketches can further be used to create a 3D design.

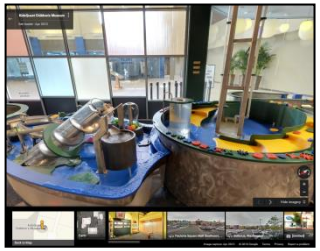
4. The roles involved for the museum construction are outlined in a game-like selector and overlay details.

5. Users can to turn the design sketch created earlier into a Gehry-inspired building, complete with sails and icebergs.

EVANTAGE CONSULTING

KidsQuest Museum Bellevue – Experiential Museums

Indoor Google Maps



https://www.google.com/maps/@47.5733898

Summary

- KidsQuest offers many programs throughout the year including early learning classes, whole-family science workshops, free art programs and many special events.
- Prospective visitors can get a preview of the museum exhibits and layout through an internal Google Maps tour.

Primary Audience(s)

- Prospective museum visitors

Stationary Display	large	tables	kiosk		
Content Platform	website	native app	sms	email	social
Portable Device	smart objects	loaner screens	visitor device	handsets	
Virtual Reality	augmented	VR headset			
Location Awareness	beacons	NFC	RFID	QR codes	GPS

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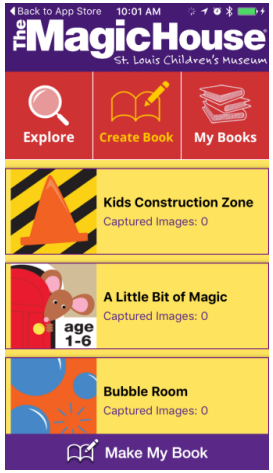
EVANTAGE CONSULTING

Magic House, St. Louis – Experiential Museums

Scavenger Hunt App



Summary

- Good To Grow! is a mobile app provided through The Magic House.
- The primary goal of the app is to engage visitors to explore the exhibits within the museum and share memories with photos taken throughout the experience.
- Photo "books" can be shared through social media or email.
- Additional challenges and questions extend the content within exhibits.

Primary Audience(s)

- Museum visitors with opportunity for parents and kids to share and commemorate the experience

Stationary Display	large	tables	kiosk		
Content Platform	website	native app	sms	email	social
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EVANTAGE CONSULTING

Magic House, St. Louis – Experiential Museums

Scavenger Hunt App

1. Location awareness allows for connection to in-museum content and information to be sent based on location to support the scavenger hunt.
2. Challenges and activities drive exploration of museum exhibits
3. Additional quizzes extend the content within the exhibits including challenge and quiz scoring
4. Photo capture and creation of "game books" facilitate and bridge in-museum experience and beyond including sharing through social media

EVANTAGE CONSULTING

The Tech Museum of Innovation – Experiential Museums

Various Technology

Summary

- The Tech is a mix of science museum, technology showcase, and education hub. Located in Silicon Valley, it is a community resource for education and innovation (awarded the National Medal for Museum and Library Services in 2015).
- Galleries/exhibits include Bio Design studio, Innovation Gallery, Innovations in Healthcare, Tech Studio, and more (http://www.thetech.org/plan-your-visit/galleries), most with interactive components suitable for kids and adults.
- Programs and workshops supporting STEM learning, engineering, creativity, and collaboration are offered in abundance including a bilingual "Family Math & Engineering" program.

Primary Audience(s)

- Museum visitors, adults and children

Stationary Display	large	tables	kiosk		
Content Platform	website	native app	sms	email	social
Portable Device	smart objects	loaner screens	visitor device	handsets	
Virtual Reality	augmented	VR headset			
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The Tech Museum of Innovation – Experiential Museums

Wearables - Body Metrics

Summary

- The Body Metrics exhibit at the Tech Museum of Innovation by Kaiser Permanente leverages the ongoing evolution of the wearable technology space.
- Guests are given wearable devices that help them track both their emotional and physical states and reactions.
- The kit itself includes a smartphone that explores the wearer's environment, a NeuroSky wireless headset that measures brain waves, and a Somaxis device that measures heart rate and muscle tension.
- The exhibit also features a data pool, a powerful 12 foot custom-developed touch screen that displays body metrics amidst visitor avatars.

Primary Audience(s)

- Museum visitors, adults and children

Stationary Display	large	tables	kiosk		
Content Platform	website	native app	sms	email	social
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EVANTAGE CONSULTING

Alignment to MCM Objectives

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●●●●●

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○○○○○

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●●●●○

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●○○○○

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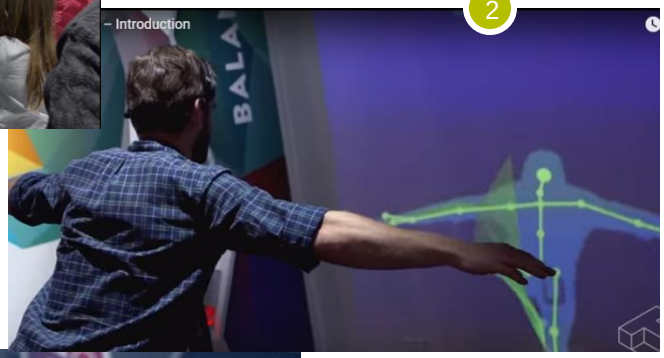
●●●●●

The Tech Museum of Innovation – Experiential Museums

Wearables - Body Metrics

1



2

3

https://www.youtube.com/watch?v=ERwktHO-jmw

1. **Heart Sync:** Up to six people can sit and watch a visual representation of their breathing and heart rate and then sync up with others.

2. **Body Moves:** Microsoft's Kinect technology powers large-scale projectors that lead visitors through three activities — Pose, Balance and Bounce — during which body position, activity and range of motion are measured.

3. **Data Pool:** Data that was collected through the process is now evaluated by placing the Sensor Kit on an interactive table that displays metrics from the entire visit. It delivers "context awareness" about what might have happened to trigger each emotion, as the data is overlaid on a cascade of photographs recorded by the Sensor Kit.

EVANTAGE CONSULTING

GuidiGo Next Gen Guided Tours – Collections Based

Google Glass + Beacons

Summary

- GuidiGo for Glass creates a hands-free multimedia experience for museums that combines Google Glass and beacons.
- As you progress with your tour, enjoy a synchronized audio and visual experience along with contextual video and location maps of the museums.
- Instantly share content on social media.
- https://www.youtube.com/watch?v=B7YGD1If9z4 (demo)

Primary Audience(s)

- Parents visiting with children

Stationary Display	large	tables	kiosk		
Content Platform	website	native app	sms	email	social
Portable Device	smart objects	loaner screens	visitor device	handsets	
Virtual Reality	augmented	VR headset			
Location Awareness	beacons	NFC	RFID	QR codes	GPS

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Alignment to MCM Objectives

Connects Exhibit to Learning Agenda

Enhances Non-Exhibit Experience

Low Disruption to Child Interaction

Creates Out-Of-Museum Continuity

Provides Ease of Use (Accessibility)

GuidiGo Next Gen Guided Tours – Collections Based

3D Indoor Geolocation

Summary

- Project Tango is a technology platform from Google that lets you use a mobile device to detect where you are without using GPS.
- 3D motion tracking, depth sensing and area learning allows a mobile device to know where it is and how it moves in relation to the world around it.
- Augmented reality delivers contextual content to the user.
- No need for an internet connection, Wi-Fi, sensors, or GPS. Museums have nothing to install and no equipment to maintain.

Primary Audience(s)

- All museum visitors

Stationary Display	large	tables	kiosk		
Content Platform	website	native app	sms	email	social
Portable Device	smart objects	loaner screens	visitor device	handsets	
Virtual Reality	augmented	VR headset			
Location Awareness	Google Project Tango				

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In November 2013, Apple acquired PrimeSense, a 3-D technology sensing company that could hint at the ability for future iPhones, iPads and Macs to have a Kinect-like ability to sense where users are and react to their movements.

Alignment to MCM Objectives

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Enhances Non-Exhibit Experience

Low Disruption to Child Interaction

Creates Out-Of-Museum Continuity

Provides Ease of Use (Accessibility)

GuidiGo Next Gen Guided Tours – Collections Based

VR / Google Cardboard

View in PowerPoint presentation mode to see animation

Summary

- GuidiGo" *Imaginary Tour"* gives you a first glimpse at virtual reality's potential to transform a museum experience.
- Since the cost of Google Cardboard is extremely low (less than $10 each), anyone can buy one and cultural sites can make it available to their visitors at very little cost.
- Even if visitors don't have Google Cardboard, they can still access 360 views on their mobile phones and tablets via the gyroscope sensor.

Primary Audience(s)

- All museum visitors

Stationary Display	large	tables	kiosk		
Content Platform	website	**native app**	sms	email	social
Portable Device	smart objects	**loaner screens**	**visitor device**	handsets	
Virtual Reality	augmented	**VR headset**			
Location Awareness	beacons	NFC	RFID	QR codes	GPS

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Alignment to MCM Objectives

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Enhances Non-Exhibit Experience

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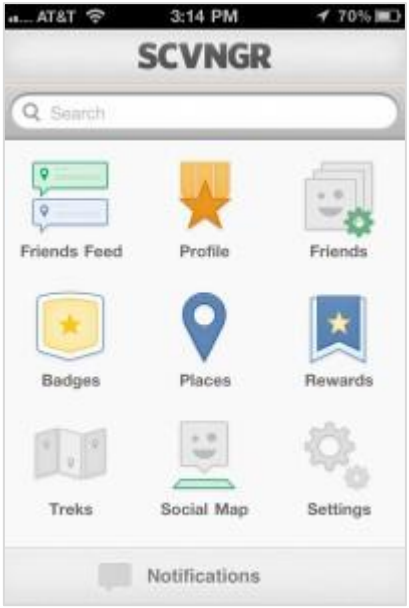
Creates Out-Of-Museum Continuity

Provides Ease of Use (Accessibility)

SCVNGR – Collections Based

Location-Based Gaming



Summary

- Google backed SCVNGR is a social, location-based gaming platform that allows visitors to explore museums in a game-like fashion.
- Experience ideal for groups of visitors to learn, share their experiences, and not feel constant pressure to stick together.
- In addition to the National Zoo, the Smithsonian, the Children's Museum of Indianapolis, the San Diego Zoo, the Minneapolis Institute of Art, the Muhammed Ali Center, The Chicago Institute of Art, the Museum of London, and over 70 other museums, zoos and cultural institutions have joined SCVNGR.

Primary Audience(s)

- All museum visitors

Stationary Display	large	tables	kiosk		
Content Platform	website	native app	sms	email	social
Portable Device	smart objects	loaner screens	visitor device	handsets	
Virtual Reality	augmented	VR headset			
Location Awareness	beacons	NFC	RFID	QR codes	GPS

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Non-Museum Experiential

Dinosaur Valley State Park

Interactive Children's Library

San Diego Zoo

Theme parks

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Dinosaur Valley State Park – Non-Museum Experiential

Info Alerts via GPS

Summary

- Visitors at the park are alerted to various points of interest as they approach by a phone vibration triggered by the hardware's GPS.
- Users can then click through for all sorts of detailed information, video and audio clips, photos, and other options highlighting a specific park feature.
- Also include a "categories" section that will list businesses, restaurants, lodging and other attractions nearby, as well as a "maps" section that can provide turn-by-turn directions on how to get to area attractions en route from Dinosaur Valley State Park.

Primary Audience(s)

- All visitors

Stationary Display	large	tables	kiosk		
Content Platform	website	native app	sms	email	social
Portable Device	smart objects	loaner screens	visitor device	handsets	
Virtual Reality	augmented	VR headset			
Location Awareness	beacons	NFC	RFID	QR codes	GPS

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Alignment to MCM Objectives

Connects Exhibit to Learning Agenda

Enhances Non-Exhibit Experience

Low Disruption to Child Interaction

Creates Out-Of-Museum Continuity

Provides Ease of Use (Accessibility)

The Interactive Children's Library – Non-Museum Experiential

RFID and Alternative Search

https://www.youtube.com/watch?v=Fu7XciJi6xY

Summary

- The Interactive Library was a collaboration between ISIS Katrinebjerg, The University of Southern Denmark, 4 professional companies and 5 public libraries.
- The project focused on developing technology solutions geared toward 6-9 years olds with an attention to bridge the gap between interactive and physical spaces. The primary goal was to provide suggestions for how the library of the future might look like.
- Interactive tables, RFID objects, alternate search options and audio annotation of books are the solutions explored through the project.

Primary Audience(s)

- Library visitors (parents and children)

Stationary Display	large	tables	kiosk		
Content Platform	website	native app	sms	email	social
Portable Device	smart objects	loaner screens	visitor device	handsets	
Virtual Reality	augmented	VR headset			
Location Awareness	beacons	NFC	RFID	QR codes	GPS

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Alignment to MCM Objectives

Connects Exhibit to Learning Agenda

●●●●●

Enhances Non-Exhibit Experience

○○○○○

Low Disruption to Child Interaction

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Creates Out-Of-Museum Continuity

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Provides Ease of Use (Accessibility)

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The Interactive Children's Library – Non-Museum Experiential

RFID and Alternative Search

1. I-Land is an interactive, RFID enabled table that displays the city of Aarhus and users can watch overlaid historical movies. Moving RFID tagged objects around the table creates digital affects.

2. "Story Surfer" is an interactive floor allows children to use their feet to choose functions and books. One of the features is a video camera embedded in the ceiling to record plays put on by the children, story telling, or other events so they can view them on a kiosk.

3. Bibphone uses RFID tags to store audio information. Users are able to listen to messages or speak to a book, sharing information beyond the pages of the physical book.

Note: RFID based tracking applications can be affected by factors such as distance and location of the tag on the object.

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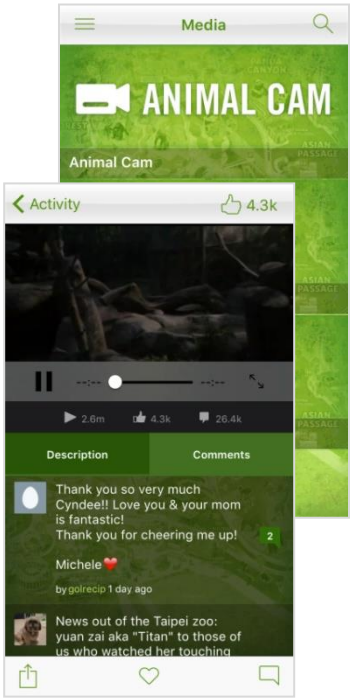
San Diego Zoo – Non-Museum Experiential

Services & Social



Summary

- The San Diego zoo mobile app combines guest services and extended information about the animals with descriptions, video, and live animal cams.
- Commenting, social sharing and game features aide visitors in exploring the zoo and app content further by offering points and badges for completing various activities.
- Direct connection to Facebook, Twitter, and Foursquare integrate the zoo app experience to extend the sharing features.
- Visitor services are available such as the zoo map, hours, dining, show information, and gift shop and ticket purchases.

Primary Audience(s)

- Parents and children at the zoo and beyond

Stationary Display	large	tables	kiosk		
Content Platform	website	**native app**	sms	**email**	**social**
Portable Device	smart objects	loaner screens	**visitor device**	handsets	
Virtual Reality	augmented	VR headset			
Location Awareness	beacons	NFC	RFID	QR codes	GPS

Alignment to MCM Objectives

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Low Disruption to Child Interaction

Creates Out-Of-Museum Continuity

Provides Ease of Use (Accessibility)

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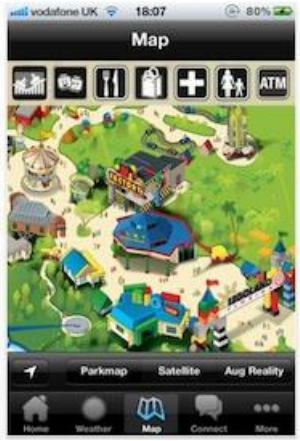
Theme Parks – Non-Museum Experiential

Assisting with Visit Logistics



Summary

- Many of the major theme parks are leveraging mobile to improve the visitor experience.
- Some of the more common functions include:
  - monitor lines for popular rides
  - make dining reservations
  - make purchases
  - plot routes using GPS-enabled maps
  - get reminders of where they parked
  - locate family members
  - advance reservations for park attractions
  - resort hotel room key
  - interactive scavenger hunts

Stationary Display	large	tables	kiosk		
Content Platform	website	native app	sms	email	social
Portable Device	smart objects	loaner screens	visitor device	handsets	
Virtual Reality	augmented	VR headset			
Location Awareness	beacons	NFC	RFID	QR codes	GPS

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Alignment to MCM Objectives

Connects Exhibit to Learning Agenda

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Provides Ease of Use (Accessibility)

Parent Ed Content Experts

Beyond The Chalkboard

Brooklyn Public Library

Ready Rosie

Vroom

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BCM & Kids Afterschool – Parent Ed Content Experts

Beyond The Chalkboard

Summary

- KIDS Afterschool was created to demonstrate that learning can be fun and it can be something kids look forward to. The website offers a place for kids to explore ideas and share their discoveries with each other.
- The program is based on the idea that teach children to talk about learning is important. Curriculum is structured to take place during out of school timeline with four key steps to: (1) Make it Matter, (2) Make it Happen, (3) Make it Click, (4) Make it Better

Primary Audience(s)

- Parents with young children at home or on-the-go

Stationary Display	large	tables	kiosk		
Content Platform	website	native app	sms	email	social
Portable Device	smart objects	loaner screens	visitor device	handsets	
Virtual Reality	augmented	VR headset			
Location Awareness	beacons	NFC	RFID	QR codes	GPS

Alignment to MCM Objectives

Connects to Learning Agenda

Enhances Non-Exhibit Experience

Low Disruption to Child Interaction

Creates Out-Of-Museum Continuity

Provides Ease of Use (Accessibility)

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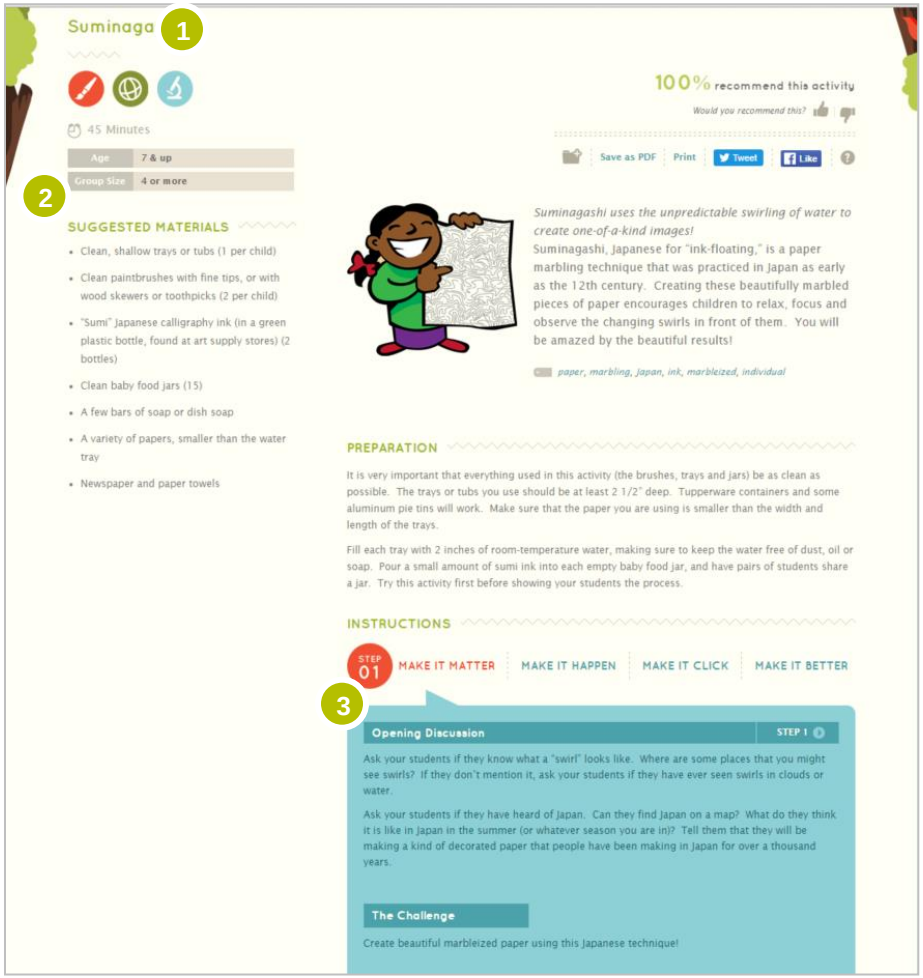
BCM & Kids Afterschool – Parent Ed Content Experts

Beyond The Chalkboard



http://www.beyondthechalkboard.com/

1. Beyond the chalkboard is a desktop optimized website but offers suggestions for activities including science, literacy, culture, health, art, math, and engineering. The principle is that learning can be fun and that learning can happen anywhere.

2. Category, amount of time to complete the activity, age ranges, group size and suggested materials are all called out clearly. Further content can be saved, printed as a PDF for shared.

3. Each activity provides additional areas of exploration and are aligned with the 4 steps. The steps are customized for each activity so parents and kids and work together. Additional challenges are also suggested along with supporting materials to help complete the activity.

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Brooklyn Public Library– Parent Ed Content Experts

Texting for Early Literacy

http://www.slj.com/2015/07/feature-articles/

Summary

- Texting became part of the Brooklyn Public Library's Ready, Set, Kindergarten program who's goal is to increase parent engagement in early literacy activities at home
- Texting offered a new way to share tips with parents such as "Find a time to read with your child everyday, at a time that works for your family"
- Initiative was inspired by a *New York Times* article (http://ow.ly/O1PaF) that reported on a research from Stanford University that found preschoolers whose parents received early literacy tips via text did better on literacy tests than children whose parents didn't receive early literacy tips via text.

Primary Audience(s)

- Parents with young children at home

Stationary Display	large	tables	kiosk		
Content Platform	website	native app	sms	email	social
Portable Device	smart objects	loaner screens	visitor device	handsets	
Virtual Reality	augmented	VR headset			
Location Awareness	beacons	NFC	RFID	QR codes	GPS

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Alignment to MCM Objectives

Connects Exhibit to Learning Agenda

Enhances Non-Exhibit Experience

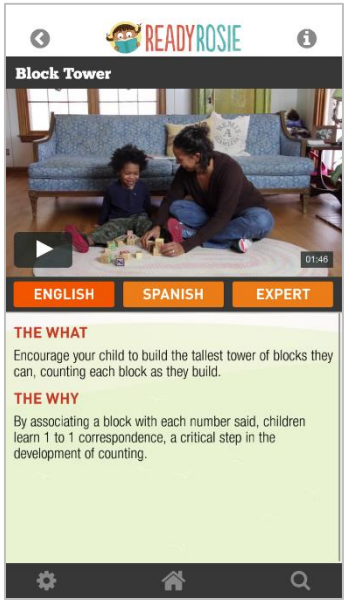
Low Disruption to Child Interaction

Creates Out-Of-Museum Continuity

Provides Ease of Use (Accessibility)

ReadyRosie– Parent Ed Content Experts

ReadyRosie



Summary

- Daily early learning activities pushed to parents via email, text or mobile app.
- Nearly 1,000 learning videos available with subscription.
- Learning is contextual and parents can choose activities related to their location, (e.g.: home, grocery, playground, etc.)
- Adoption primarily within school districts.

Primary Audience(s)

- Parents with young children

Stationary Display	large	tables	kiosk		
Content Platform	website	native app	sms	email	social
Portable Device	smart objects	loaner screens	visitor device	handsets	
Virtual Reality	augmented	VR headset			
Location Awareness	beacons	NFC	RFID	QR codes	GPS

Alignment to MCM Objectives

Connects to Learning Agenda ●●●●●

Enhances Non-Exhibit Experience ○○○○○

Low Disruption to Child Interaction ●●●●●

Creates Out-Of-Museum Continuity ●●●●●

Provides Ease of Use (Accessibility) ●●●●○

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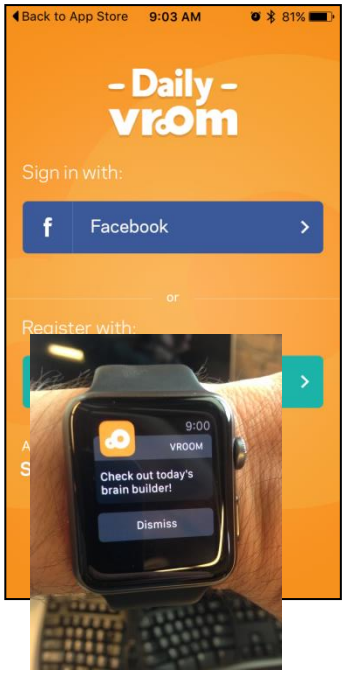
Vroom– Parent Ed Content Experts

Daily Vroom App



Summary

- Daily Vroom is an mobile app that initiates small "brain building" activities on a daily basis. The app will send reminders (if notifications are enabled) to complete activities with your child at home or other places on the go.
- Demonstrates that learning moments can be small and occur anywhere.
- Reminders, suggested daily activities, and "pick your own" activities are available and badges and awards facilitate "playful learning" moments.

Primary Audience(s)

- Parents with young children at home or on-the-go

Stationary Display	large	tables	kiosk		
Content Platform	website	native app	sms	email	social
Portable Device	smart objects	loaner screens	visitor device	handsets	
Virtual Reality	augmented	VR headset			
Location Awareness	beacons	NFC	RFID	QR codes	GPS

EVANTAGE CONSULTING

Alignment to MCM Objectives

Connects Exhibit to Learning Agenda ●●●●●

Enhances Non-Exhibit Experience ○○○○○

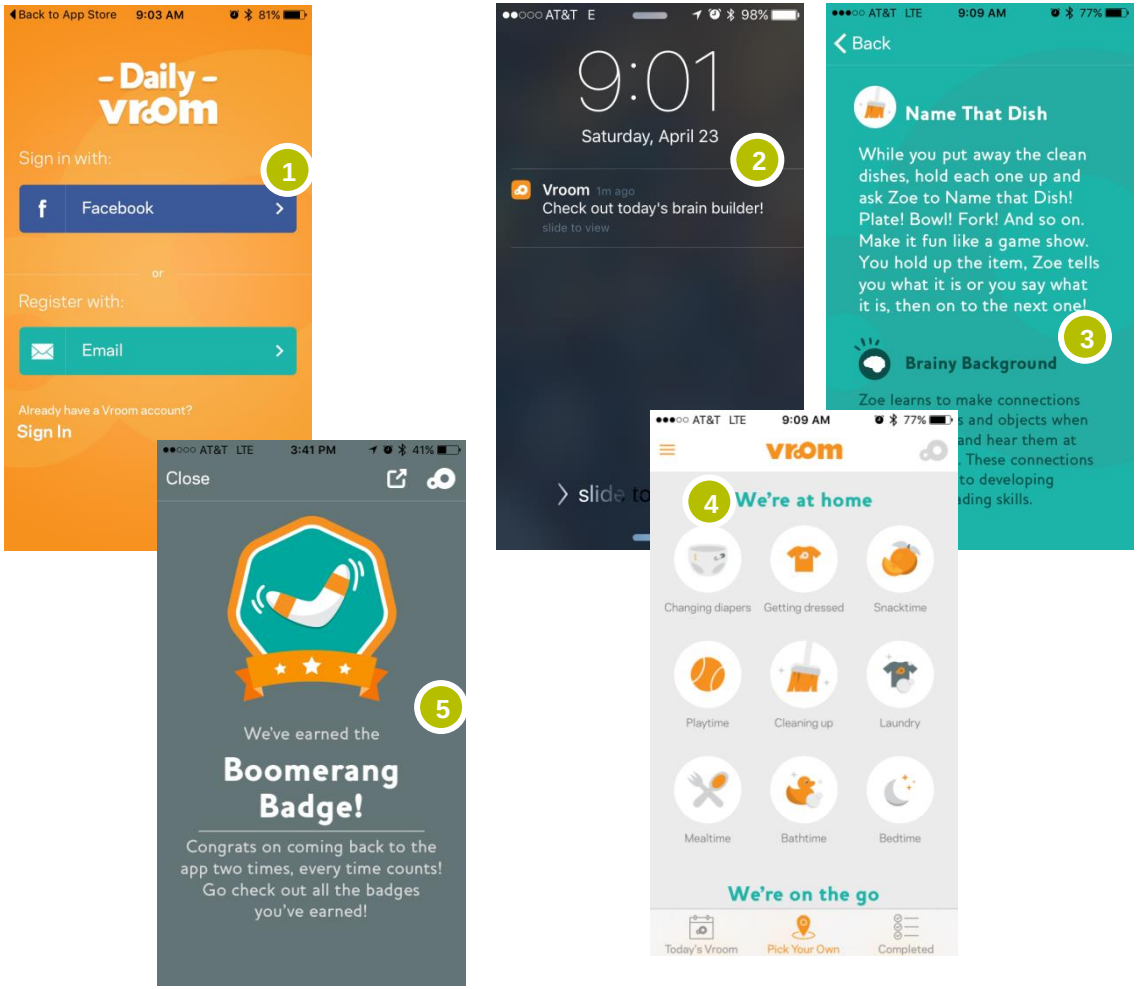
Low Disruption to Child Interaction ●●●●●

Creates Out-Of-Museum Continuity ●●●●●

Provides Ease of Use (Accessibility) ●●●●○

Vroom– Parent Ed Content Experts

Daily Vroom App



1. Set-up and login is geared to social sharing through Facebook
2. Notifications are sent daily as a reminder to engage in the daily brain builder activity. Users can determine the timing of the messages or opt out altogether.
3. Activities are simple and focus on tasks that can be accomplished with only minimal interruption in the day. The "Brainy Background" is included which provides parents with additional information learning benefits of the activity
4. In addition to the daily brain builders, users can select their own including those on the go and at home.
5. Levels and badges help inspire engagement and social sharing is strongly encouraged.

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Comparative Ratings

Slide #	Alignment to MCM Objectives	Connects Exhibit to Learning	Enhances Non-Exhibit Experience	Low Disruption to Child Interaction	Creates Out-Of-Museum Continuity	Provides Ease of Use	Overall Score	Category
73	Brooklyn Public Library (Text for Literacy)	5.0	0.0	5.0	5.0	5.0	4.0	Parent Ed Content
71	Beyond the Chalk Board	5.0	0.0	5.0	5.0	5.0	4.0	Parent Ed Content
41	Boston Childrens Museum	5.0	0.0	4.0	5.0	5.0	3.8	Experiential Museums
72	Ready Rosie	5.0	0.0	5.0	5.0	4.0	3.8	Parent Ed Content
75	Daily Vroom	5.0	0.0	5.0	5.0	4.0	3.8	Parent Ed Content
32	Corning Museum of Glass (Glass App)	4.0	4.0	2.0	4.0	4.0	3.6	Collections Based
45	Childrens Museum of Houston	4.0	2.0	3.0	5.0	4.0	3.6	Experiential Museums
47	Childrens Museum of Indianapolis (Exhibit Related Apps)	4.0	0.0	5.0	5.0	4.0	3.6	Experiential Museums
48	Childrens Museum of Indianapolis (What's Your Style App)	4.0	0.0	5.0	4.0	4.0	3.4	Experiential Museums
33	Crystal Bridges (State of the Art)	4.0	1.0	3.0	4.0	4.0	3.2	Collections Based
42	Canadian Museum of Civilization	4.0	3.0	2.0	3.0	4.0	3.2	Experiential Museums
44	Children's Museum of Denver	3.0	0.0	5.0	5.0	3.0	3.2	Experiential Museums
65	Dinosaur Valley State Park (Info Alerts via GPS)	4.0	5.0	3.0	1.0	3.0	3.2	Experiential Non-Museums
66	Interactive Children's Library (RFID and Alternative Search)	5.0	0.0	4.0	2.0	5.0	3.2	Experiential Non-Museums
68	San Diego Zoo (Services & Social)	3.0	5.0	3.0	1.0	4.0	3.2	Experiential Non-Museums
31	Cooper Hewitt (Digital Pen)	3.0	0.0	4.0	4.0	4.0	3.0	Collections Based
35	Minneapolis Institute of Art (Art Stories)	4.0	1.0	2.0	4.0	4.0	3.0	Collections Based
37	Minneapolis Institute of Art (Interactive Map)	4.0	0.0	4.0	2.0	5.0	3.0	Collections Based
39	9/11 Memorial Musuem	4.0	0.0	4.0	2.0	5.0	3.0	Experiential Museums
43	Chicago Field Museum	4.0	0.0	3.0	4.0	4.0	3.0	Experiential Museums
57	Tech Museum (Various Technology)	5.0	0.0	4.0	1.0	5.0	3.0	Experiential Museums
58	Tech Museum (Body Metrics)	5.0	0.0	4.0	1.0	5.0	3.0	Experiential Museums
52	Fondation Louis Vuitton – ArchiMoi App	5.0	0.0	4.0	0.0	5.0	2.8	Experiential Museums
55	Magic House	4.0	0.0	3.0	3.0	4.0	2.8	Experiential Museums
60	GuidiGo Next Gen Guided Tours (Google Glass & Beacons)	4.0	2.0	5.0	0.0	3.0	2.8	Experiential Museums
61	GuidiGo Next Gen Guided Tours (3D Indoor Geolocation)	4.0	3.0	3.0	0.0	4.0	2.8	Experiential Museums
63	SCVNGR (Location based gaming)	4.0	1.0	5.0	1.0	3.0	2.8	Experiential Museums
69	Theme Parks (Visit Logistics)	1.0	5.0	2.0	0.0	4.0	2.4	Experiential Non-Museums
62	GuidiGo Next Gen Guided Tours (VR / Google Cardboard)	1.0	1.0	2.0	4.0	3.0	2.2	Experiential Museums
30	Brooklyn Museum of Art (ASK App)	2.0	1.0	3.0	0.0	4.0	2.0	Collections Based
54	KidsQuest Musuem Bellvue (Indoor Google Maps)	0.0	1.0	2.0	3.0	3.0	1.8	Experiential Museums
49	Childrens Museum of Indianapolis (Cardboard Tour)	2.0	0.0	0.0	3.0	3.0	1.6	Experiential Museums

Summary Considerations for Museums

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Connecting Exhibit to Learning

Predominant purpose of museums leveraging technology is providing deeper information about the exhibit, rather than learning about exhibit interaction.

Use of location awareness technology provides desired context and personalizes the learning experience (e.g.: relevant to "where YOU are," potential to deliver customized content based on ages of children, etc.).

Explore partnerships or white-label with existing platforms rather than building your own technology that will require ongoing updating, (e.g.: GuidiGo).

Scavenger hunt apps are effectively used to give clues to kids that require them to try things at different exhibits, while delivering educational content to parents.

Wearable technology can assist kids making connections between physical activities and digital information. Wearables can also assist those with visual, auditory, or physical disabilities.

Enhancing Non-Exhibit Experience

Managing visit logistics is the predominant purpose for apps and other technology used by non-museum venues, (e.g.: theme parks).

In addition to exhibit information, general visit information is expected content from a museum app.

Enabling the purchase and use of electronic tickets on a visitor's device can eliminate their need to wait in line. Can also incent visitors to plan their visit ahead of time, explore content, or even download an app.

Enable or promote social options so visitors can share experiences and recommendations with other visitors or prospective visitors. Connection or integration with social media sites allows content to be shared within the app and social network and even potentially display within exhibit.

Ensuring Low Disruption to Child Interaction

Kiosks, wall-mounted display screens, or tethered tablets do not easily accommodate use by multiple parents.

Tablets for parent use may become an unwanted distraction for children.

Parents using smartphones while with their children has become commonplace and therefore, not a significant distraction for the kids, but introduces some limits with child interaction.

“Heads-up” displays like Google glass offer low disruption to child interaction, but likely require instruction for use (e.g.: via video / wall display).

Learning content should be skewed more visual than audio, (e.g.: include text graphics on video), to ensure low disruption.

Creating Out-Of-Museum Continuity

Apps provide good opportunity for extending learning beyond museum visit. Offer playful, game-like options such as badges and leaderboards to inspire child engagement and sharing with parent.

Connect exhibit concepts to in home exploration. Provide suggestions for 3rd party tablet or smartphone apps that work well with the subject matter.

Consider exploring partnerships with parent ed content platforms, including white label models.

Text message programs can help remind parents to connect learning with everyday activities play. Using themes from exhibits will further connect museum content for parents and children.

Providing Ease Of Use (Accessibility)

Smartphone and app usage is growing in penetration across all socio-economic consumer segments (currently 58% in U.S.).

Texting campaigns offer a low barrier to participation – users often only need to text a keyword to a service to begin. Texting is the most common behavior, but may also impact user's data charges.

Consider offering free (or sponsored) Wi-Fi, as well as device charging stations to accommodates BYOD learning experiences.

Project Tango and BrightLyte technology offers location awareness with low tech requirements for museum, but app download for user.

Allowing visitors to explore newer technology during their museum visit, (e.g.: smart objects, augmented or mixed reality) could be part of a learning experience.

Corning Museum of Glass – Implementation Insight

Recommended Read re: BYOD

Scott Sayre is chief digital officer at the Corning Museum of Glass, where he is responsible for overseeing the Museum's digital program onsite and online.

Following is an article Steve published explaining how to ensure the success of BYOD programming in the museum environment.

http://mw2015.museumsandtheweb.com/paper/bring-it-on-ensuring-the-success-of-byod-programming-in-the-museum-environment

BYOD Variables of Success

1. Awareness
2. Access
3. Compatibility
4. User capability
5. Supporting amenities
6. User interest
7. Usability
8. Impact

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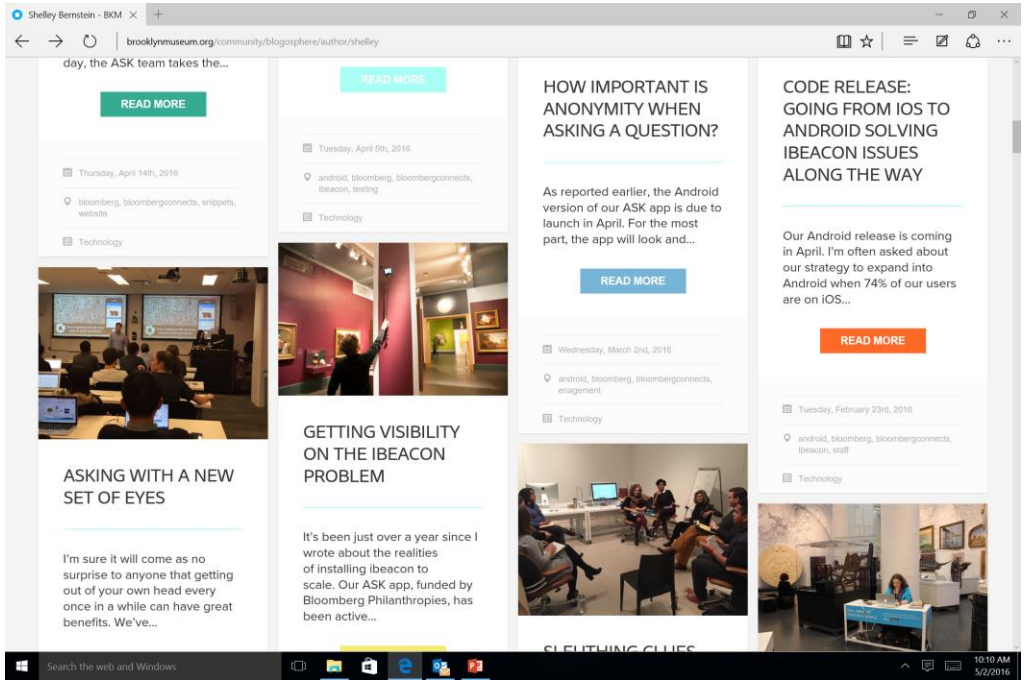
Brooklyn Museum of Art – Location Awareness Implementation

Location-Awareness Insights

Shelley Bernstein is the Vice Director of Digital Engagement & Technology at the Brooklyn Museum where she works to further the Museum's community-oriented mission through digital projects.

Her blog has several posts that track their successes and challenges, including those related to the ASK app and beacons installation.

https://www.brooklynmuseum.org/community/blogosphere/author/shelley/



Related blog posts

1. Code Release: Going from iOS to Android Solving iBeacon Issues Along the Way
2. Getting Visibility on the iBeacon Problem
3. The Realities of Installing iBeacon to Scale
4. Piloting the Complexities of Migrating iPad Kiosks into ASK

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Additional Examples

Appendix A

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Center for the Future of Museums – Technology Forward

Blog & Online Forum

aam-us.org/resources/center-for-the-future-of-museums/projects-and-reports/trendswatch

futureofmuseums.blogspot.com

1. Part of the American Alliance of Museum, the Center for the Future of Museums (CFM) helps museums shape a better tomorrow by exploring cultural, political, technological, and economic topics.

2. TrendsWatch digital publication (PDF) that explores technology and other factors shaping the future of museums.

3. Additional publications such as "Building the Future of Education MUSEUMS AND THE LEARNING ECOSYSTEM"

4. The blog was created in 2009 by the founding director Elizabeth Merritt. The goal is to bring forward topics and conversation about the future of museums. Content includes cultural, social, technology and other trends relating to museums. Tag cloud clearly shows a strong connection to technology topics.

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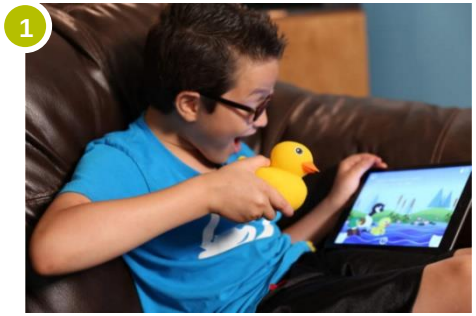
Smart Objects – Digital and Physical Connection

Physical Play, Digital Display

1



http://www.apple.com/shop/product/HJNR2VC/A/edwin-the-duck-learning-toy

2

http://www.apple.com/shop/product/HJCP2ZM/A/osmo-genius-kit-game-system-for-ipad

1. Edwin the Smart Duck connects the physical world with the digital world in a unique and playful way. The duck character appears on the screen and is controlled with the duck figure.

   Edwin works with a number of games, stories, songs and lessons.

2. Osmo is a unique educational gaming accessory that connects iPad to the physical play using shapes, letters, and numbers. It offers games such as Numbers, Tangram, Newton, Words, and Masterpiece.

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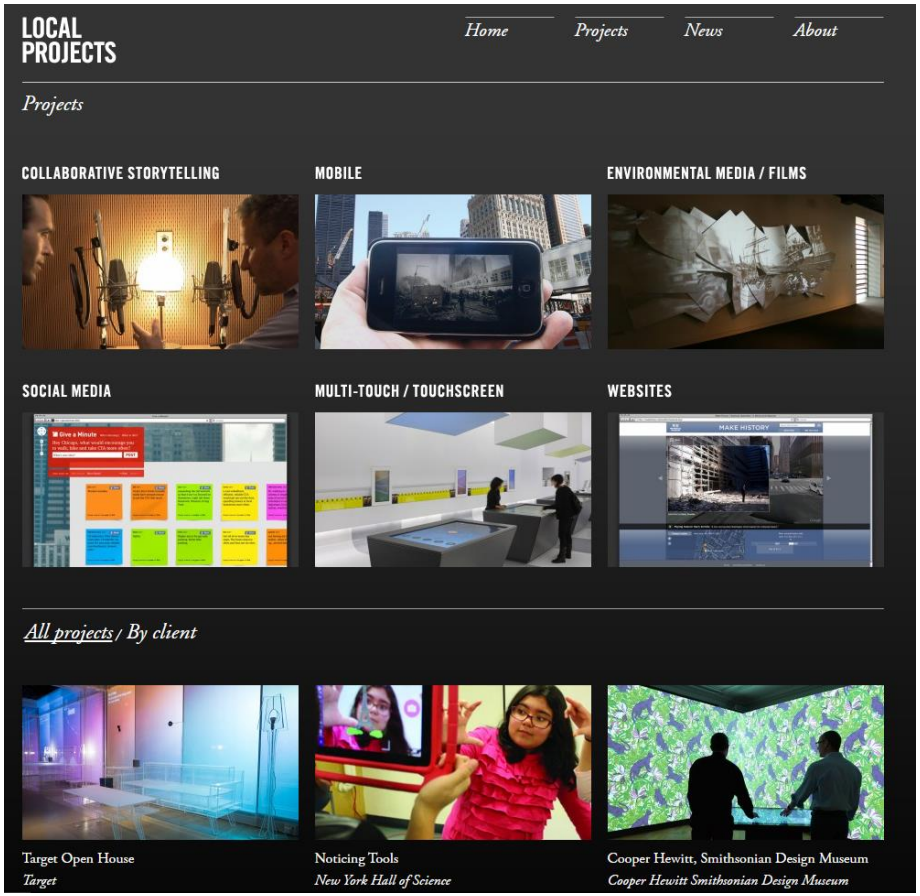
Local Projects



http://localprojects.net/about/

Local Projects is an experience design and strategy firm with a passion for testing the limits of human interaction. They are responsible for the concept designs, media, physical architecture, software, hardware, and content for exhibits at some of the world's top museums, cultural institutions, and attractions.

Boston Children's Museum – Experiential

Arthur's World & Flight

http://www.bostonglobe.com/lifestyle/specials/childrens

http://www.museumtech.com
/boston_children-flight.htm

Arthur's World offers a group of activities that allow parents and children top participate in play with the famous aardvark Arthur.

1 The chroma-key installation even allows children and parents to join Arthur digitally and appear onscreen. There are an additional two traveling installations of this.

2 Parents and children can serve as co-pilots on a cross-country plane trip (visiting 5 cities) with Buster or see themselves on screen with Arthur and his buddies.

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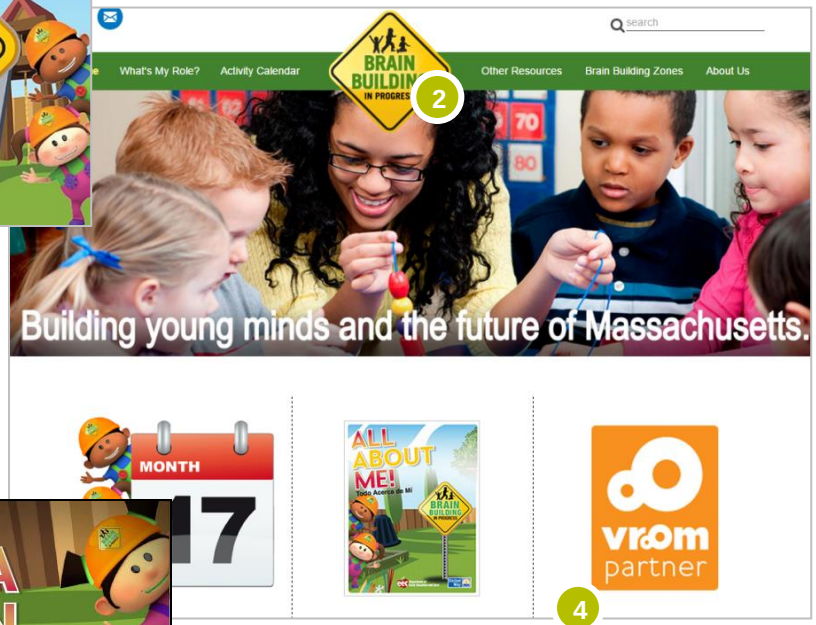
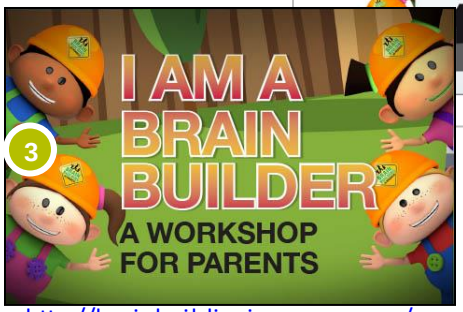
Massachusetts Brain Building – Parent Ed Content Experts

Brain Building



http://brainbuildinginprogress.org/featured-partnerships/vroom



http://brainbuildinginprogress.org/parent-workshop

1. BCM was selected to implement a statewide strategy for museums and libraries to collaborate in the local community and offer support for early child learning including the state's Brain Building in Progress campaign.

2. The website provides background information, activities, and resources for parents and educators. Resources such as activity books and marketing materials can be shared via e-mail or printed.

3. 45-60 minute parent workshop materials are available through the program to support the message The More We Know, The More We'll Help Children Grow".

4. Brain Building partners with Vroom to further support the mission to find small moments for brain building and access to resources to make it fun and easy.

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Chicago Children's Museum – Experiential Museums

Written Guides Only

Make a Mobile!

Alignment with NGSS
K. Forces and Interactions: Pushes and Pulls
K-2. Engineering Design

Key Ideas: Stability and Balance

Through mobile making, this lesson helps students explore the concepts of balance, counterbalance, weight and counterweight. This fun, hands-on science lesson can be replicated and home or school again and again.

Background Information/Vocabulary

- A **mobile** is a hanging structure that is a balanced system. Because it is balanced, a breeze might make it move, but it won't tip over.
- Artist **Alexander Calder** was fascinated with engineering and balance. He used balance to create delicate sculptures that used rods and objects that balanced each other. He named his sculptures mobiles because they seemed to be in constant motion from air currents inside and outside. His mobiles move, but always return to a stable position.
- **Vocabulary (for children ages 7+)**: balance, stable, weight, mobile, counterbalance, counterweight, gravity, balance point.

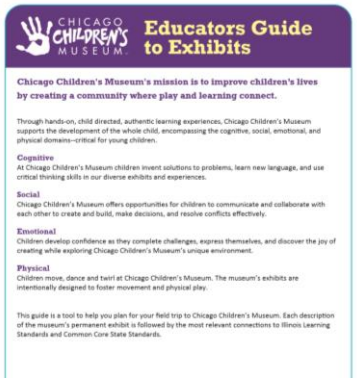
Materials

Gather materials for mobile

- String, wire, fishing line
- Pipe cleaners
- Balance rod (can be wooden, PVC pipe, tree branch, coat hanger, etc.)
- Scale to weigh objects (optional)

Gather objects to balance

- Recycled materials (plastic pop or salad dressing bottle and caps, cardboard tubes, egg cartons, old magazines, etc.)
- Natural materials (sticks, pinecones, dried flowers, shells, etc.)



CHICAGO CHILDREN'S MUSEUM

Educators Guide to Exhibits

Chicago Children's Museum's mission is to improve children's lives by creating a community where play and learning connect.

Through hands-on, child directed, authentic learning experiences, Chicago Children's Museum supports the development of the whole child, encompassing the cognitive, social, emotional, and physical domains—critical for young children.

Cognitive
At Chicago Children's Museum children invent solutions to problems, learn new language, and use critical thinking skills in our diverse exhibits and experiences.

Social
Chicago Children's Museum offers opportunities for children to communicate and collaborate with each other to create and build, make decisions, and resolve conflicts effectively.

Emotional
Children develop confidence as they complete challenges, express themselves, and discover the joy of creating while exploring Chicago Children's Museum's unique environment.

Physical
Children move, dance and twirl at Chicago Children's Museum. The museum's exhibits are intentionally designed to foster movement and physical play.

This guide is a tool to help you plan for your field trip to Chicago Children's Museum. Each description of the museum's permanent exhibit is followed by the most relevant connections to Illinois Learning Standards and Common Core State Standards.

Summary

- Positioning of "Where Play and Learning Connect"
- Downloadable pdfs of content for educators and parents to connect exhibits to pre-visit and post-visit activities.

Primary Audience(s)

- Educators and parents

Stationary Display	large	tables	kiosk		
Content Platform	website	native app	sms	email	social
Portable Device	smart objects	loaner screens	visitor device	handsets	
Virtual Reality	augmented	VR headset			
Location Awareness	beacons	NFC	RFID	QR codes	GPS

Alignment to MCM Objectives

Connects Exhibit to Learning Agenda

Enhances Non-Exhibit Experience

Low Disruption to Child Interaction

Creates Out-Of-Museum Continuity

Provides Ease of Use (Accessibility)

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Personalized Guides

Searching for names in the memorial

Send map through SMS or email

Find memorial tiles by honoree or donatee

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Midland County Public Library – Non-Museum Experiential

Touchscreen Card Catalog

https://www.youtube.com/watch?v=WksFwU2VkhU

Summary

- This library features tech upgrades and a museum-like appeal, complete with life-size trees, pictures of animals, and a room with its ceiling portraying planet Earth.
- The primary interactive features are 46-inch digital signage touchscreens to give patrons virtual access to the facility's books and media through and interactive card catalog.
- Displays book titles in a traditional way -- it shows the original book covers sitting on what looks like a wooden book shelf.

Primary Audience(s)

- Library visitors (parents and children)

Stationary Display	large	tables	kiosk		
Content Platform	website	native app	sms	email	social
Portable Device	smart objects	loaner screens	visitor device	handsets	
Virtual Reality	augmented	VR headset			
Location Awareness	beacons	NFC	RFID	QR codes	GPS

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Alignment to MCM Objectives

Connects Exhibit to Learning Agenda

Enhances Non-Exhibit Experience

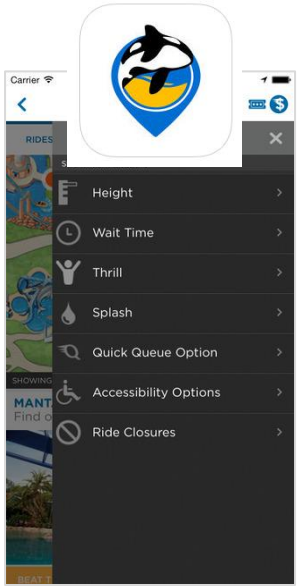
Low Disruption to Child Interaction

Creates Out-Of-Museum Continuity

Provides Ease of Use (Accessibility)

Sea World– Non-Museum Experiential

SeaWorld Discovery App



Summary

- SeaWorld App Discovery Guide gives users exclusive offers and deals, show times, ride wait times, an interactive map, fun photo frames, park tips and even a scavenger hunt.
- Quizzes let users test their knowledge as you collect badges and even earn in-park rewards.
- Learn more about animals, conservation status, and locations where you can connect with them.

Primary Audience(s)

- Parents and children at the park

Stationary Display	large	tables	kiosk		
Content Platform	website	native app	sms	email	social
Portable Device	smart objects	loaner screens	visitor device	handsets	
Virtual Reality	augmented	VR headset			
Location Awareness	beacons	NFC	RFID	QR codes	GPS

Alignment to MCM Objectives

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Creates Out-Of-Museum Continuity

Provides Ease of Use (Accessibility)

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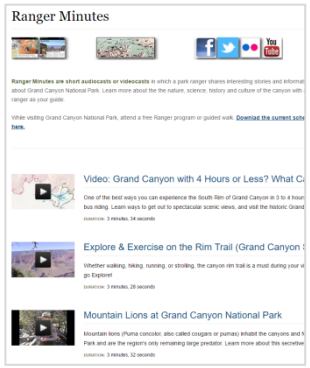
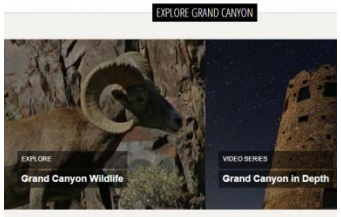
The Grand Canyon – Experiential

Field Updates & Video





Summary

- Ranger Minutes are updates from rangers in the field and contain articles, tips, and videos for visitors to the canyon.
- Video learning content is available on the website.

Primary Audience(s)

- Canyon visitors

Stationary Display	large	tables	kiosk		
Content Platform	**website**	native app	sms	email	social
Portable Device	smart objects	loaner screens	visitor device	handsets	
Virtual Reality	augmented	VR headset			
Location Awareness	beacons	NFC	RFID	QR codes	GPS

Alignment to MCM Objectives

Connects Exhibit to Learning Agenda

Enhances Non-Exhibit Experience

Low Disruption to Child Interaction

Creates Out-Of-Museum Continuity

Provides Ease of Use (Accessibility)

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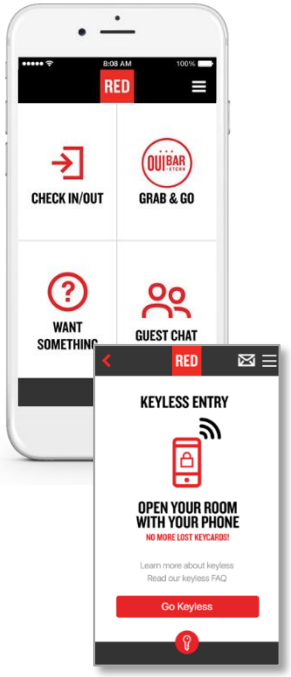
Radisson Red Hotel – Non-Museum Experiential

Hotel Guest Services App



Summary

- The Radisson Red app intends to help guests get more out of their hotel experience with convenient features, including check-in/out of the room, order food, connect with the front desk or request other items for the room.
- The app connects users to others through a guest chat feature that allows users to share opinions of nearby sites, bars and restaurants, or even organize a ride share to the airport
- Keyless entry is the most enticing of the app's features and let's guests use their phone as the key to enter their room using NFC technology.

Primary Audience(s)

- Hotel guests

Stationary Display	large	tables	kiosk		
Content Platform	website	native app	sms	email	social
Portable Device	smart objects	loaner screens	visitor device	handsets	
Virtual Reality	augmented	VR headset			
Location Awareness	beacons	NFC	RFID	QR codes	GPS

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Alignment to MCM Objectives

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Tech Literature Review

Appendix B

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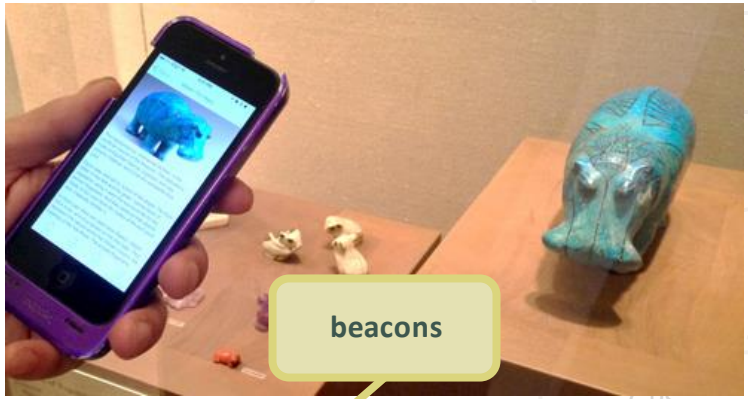
the met

"What really excites me about [beacons] is not that it's going to help museums build great mobile apps (we already have one of those!), but, rather, how open it is—that it opens the door for nonprogrammers to build their own location-based experiences and share them with others. If a museum puts some beacons in its galleries, any device can find them, and any app can use those beacons to trigger content."

—Don Undeen, The Met MediaLab



pushing location

beacons

native mobile app

visitor devices

http://www.metmuseum.org/blogs/digital-underground/2015/beacons

going deep

kiosks/ fixed tablets

native mobile app

social media

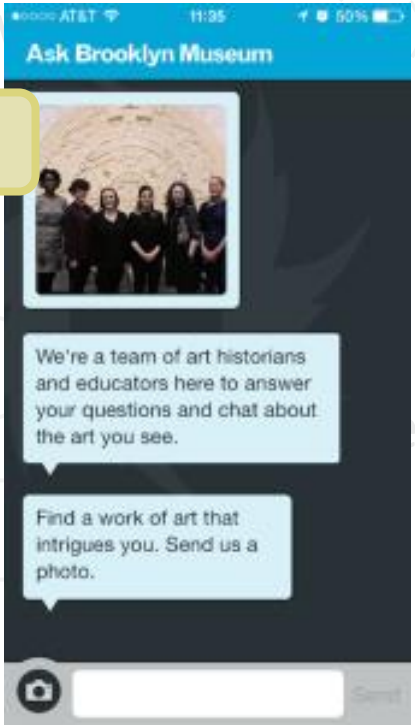
new orleans museum of art

"Artifact Apps will be installed on tablet devices … place visitors in control of a wealth of interpretive content, enabling them to customize their experience according to their individual interests. Hotspots placed over a digital image of the work of art enable visitors to investigate specific details. […] Prompts empower visitors to delve more deeply into contextual information about the work, such as artist, time period, or style. Multimedia content such as video and audio can be included. Additionally, a 'Share Your Thoughts' screen creates opportunities for visitors to dialog with the museum through social media connections and assessment tools."

Next Practices in Digital Technology, Association of Art Museum Directors, 2015

brooklyn museum

"ASK is the newest iOS app developed by the Brooklyn Museum to allow visitors to ask questions during their museum visit, and have Audience Engagement staff on the other end answering their questions live via the text-messaging feature of the app. As visitors ask questions, a member of the Audience Engagement staff not only responds to the question, but they know where the visitor is located based on iBeacons that the museum has installed throughout the galleries."



beacons

native mobile app

visitor devices

contextual conversations

https://artmuseumteaching.com/2015/07/23/the-big-ask-experiencing-the-brooklyn-museums-ask-app/

ease of access

large displays

kiosks/ fixed tablets

touchscreen tables

website

visitor devices

corning museum of glass

"In BYOD, program awareness is key. The marketing of GlassApp encourages visitors to connect to the museum's robust Wi-Fi network. Once connected, the web app automatically loads, providing immediate access without the need to download additional software.

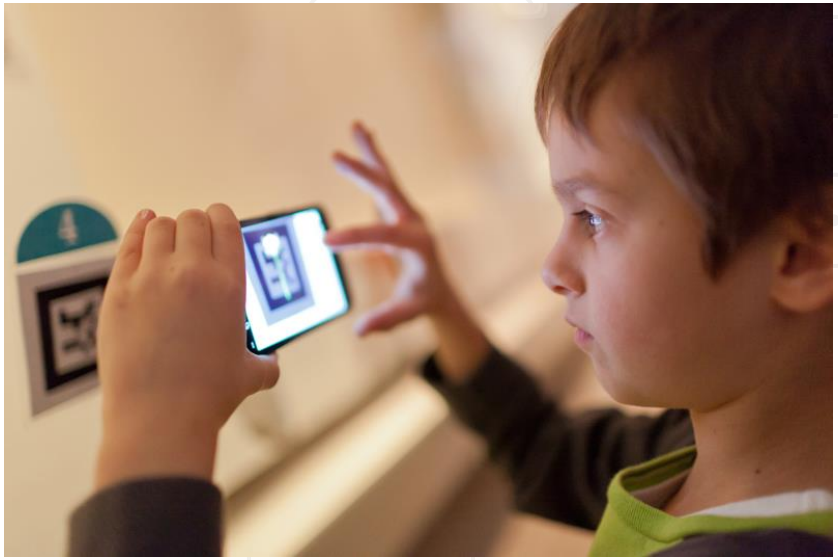
"Beyond print-based and front-line marketing, video monitors stationed throughout the museum run a trailer…. iPads mounted on gallery benches and a multi-touch table provide visitors access to the BYOD program content in a larger format, and encourage users to continue the experience on their own devices."

Next Practices in Digital Technology, Association of Art Museum Directors, 2015

the british museum

"As a technology platform and interaction style, AR is still in its infancy. Many applications are mere proof-of-concept rather than robust solutions integrated into museums' existing programmes and interpretative strategies. But this does not diminish its potential for creating engaging and meaningful experiences for visitors. AR may have been overhyped to begin with but we are now entering a more serious phase during which its usefulness will become evident."

—Shelley Mannion, The British Museum



objects

portable device

loaner screens

native mobile app

visitor devices

audio handsets

website

SMS

interactive engagement

content platform

email

augmented reality

virtual reality

http://www.museum-id.com/idea-detail.asp?id=336

social media

VR

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physical interaction

touchscreen tables

NFC

smart objects

cooper hewitt

"The Pen combines two main technologies. Its interface with the interactive tables employs the sort of conductive materials common to touchscreen styli. […] A sensor in the end of the Pen reads the information on small NFC tags embedded in the object labels. This information is stored in the Pen's onboard memory and can be read at the interactive tables.

"Using the large, ultra-high-definition screens on tables designed by Ideum, visitors may explore and manipulate the objects they have collected, discover related objects in Cooper Hewitt's collection, retrieve contextual information, learn more about designers, design processes and materials, watch and share videos and even sketch their own designs."

http://www.cooperhewitt.org/new-experience/designing-pen/

Questions to consider

Experiences over artifacts

Most of the literature talked about technology implementations in museums that housed collections. How do the technological building blocks come together to support experiential exhibits?

MCM-specific considerations

Different settings bring with them different requirements. Immersive virtual reality may be great in some contexts but not in others. What principles (visibility, accessibility to all, multi-modal engagement, opt-in, etc.) are most important to an eventual approach?

Sources for Literature Review

These are the documents and websites consulted for the literature review discussed in this presentation.

Document	Published
NMC Horizon Report: 2011 Museum Edition	2011
Helping Parents Help Their Children, Brookings	2016
Jennifer Foley Q&A - Using Digital to Engage Museum Visitors, QuickTapSurvey.com	2016
Mobile In Museums Study — 2012, A Survey of American Alliance of Museums (US) and Museums Association (UK) Members	2012
Museums turn to technology to boost attendance by millennials, *The New York Times*	2015
Next practices in digital and tech, Association of Art Museum Directors	2015
The Digital Future: How Museums Measure Up, *The New York Times*	2015
The Realities of Installing iBeacon to Scale, The Brooklyn Museum	2015
Museums and the Digital Revolution, Thinkwell	2014
Presentation: Mobile Giving Goes Local, Ron Weber	2011
http://www.digitaltrends.com/cool-tech/how-museums-are-using-technology/	2015
https://www.brooklynmuseum.org/community/blogosphere/2014/10/14/positioning-visitors-with-ibeacons/	2014
http://wiki.museummobile.info	various
http://chnm.gmu.edu/labs/mobile-for-museums/	2009