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A prototypical Computer Museum

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Purpose and Approach

Over the past few years, MOSI has become the largest and most successful science and technology museum in the southeast United States. Built on an existing military airfield, the first section of the MOSI was constructed during the 1970’s. A major addition by Antoine Predock was finished during the 1990’s. This addition expanded the size of MOSI to 250,000 square feet, and included an I-Max theater as the anchor for the site and its contents.

MOSI’s mission statement focuses on education on a regional level. Its major themes include the environment, personal wellness and space travel.

While we prepare for the 21st century, I propose a third addition to the site. This addition would create a timeline of architecture and technologies along Fowler Avenue. The structures built and the future buildings reference the media housed within through the technology of that time period. Our time is that of the computer. The computer and the technology it evokes will facilitate a structure whose boundaries are as fluid as the transmission of information within.

Our current building technologies are not evolving at the same rate as the creative minds that design in this fluid state. Therefore, save materiality, architects are still building out of sticks and stones while designers create entire urban settings within this virtual world. Until we as architects and builders are able to trick gravity into allowing this fluid state of being into our “real” world, zones
must be created and penetrated to allow for this fluidity to coalesce.

No longer should a building stand for the boundaries of inside and out, but for the interaction of zones once considered inside and out. Allowing for the constant interaction between those on the outside and those within helps to create a fluidity of space and time. To facilitate this, the building needs to respond to its inhabitants and also inform the passersby. Walls become view ports, windows become portals revealing the innards of the structure along with its functions, information givers. This once static boundary lifts its veil to create an interactive zone of information revealing its purpose to all.

Case Studies 1

The Exploratorium, San Francisco, CA

The Exploratorium, on the cutting edge of the technological age, just completed its second annual Multimedia Playground which ran for three months. The curators believe, “One of the most compelling aspects of these technologies is that they encourage new collaborative possibilities for research, design and learning.” The Multimedia playground presented a variety of special projects that were created from diverse professional and creative partnerships, with a strong sense of community access. One of the topics introduced during this time was a retrospective which looked at the history of the future. The subject matter ranged from
envisioning a technological future at World's Fairs to the Future of Nature.

Founded in 1969, the Exploratorium has 600,000 visitors each year, 60% of which are adults and 40% of which are children. Their public programs include over 650 permanent, interactive exhibits, displays, and artwork designed, prototyped, and built on-site. Two to three major temporary exhibitions are held each year along with visual, performance, and media art programs and craft demonstrations. Over 10,000 teachers participate annually in professional development programs. 3.5 million people a year access their website. Their 98-99 budget is $15,437,000 with no operating deficit. They have 399 employees, 135 of which are full time and 175 active volunteers.

The Tech, Museum of Innovation, San Jose, CA

The Tech Museum of Innovation hopes to be the newest and most exciting destination in southern California with its new home being designed and built by Ricardo Legorreta. The Tech has 250 high tech interactive exhibitions that are divided into four themed galleries, in addition to an IMAX theatre. Over 650,000 visitors are expected during the inaugural year, and is scheduled to be open for business in November of this year.

Questacon, Canbreea, Australia

The Questacon is Australia’s premiere hands-on science and technology center. Its doors opened November of 1988, attracting an annual average of 350,000 visitors of
all ages. The technology center incorporates over 180 interactive exhibits. Additionally, the Questacon has several traveling exhibitions that are now to Asia, the Pacific and other parts of the world. Over 1 million people have interacted with these traveling exhibitions. The center also presents lectures, workshops, conferences and special events on a wide range of topics.

MIT Media Laboratory, Boston, MA

MIT, perhaps the best known of the case studies, was formed in 1980. In 1985, MIT’s media center moved into their new building designed by I.M. Pei. Recent renovations to I.M. Pei’s original building added a media center, and technological laboratories. The MIT Laboratory is organized into three areas: learning and common sense, perceptual computing and information, and entertainment. Its academic program includes approximately 30 faculty members and 80 support staff. 164 students are enrolled in the program, which consists of a master’s, and doctorate program. Their research consortium is again categorized into four groups: digital life, news in the future, things that think, and toys of tomorrow. In this arena the computers significantly outnumber the people. The media lab’s annual budget is approximately $25 million, 90% of which comes from corporate sponsors. This reflects the lab’s commitment to collaborative research.

(MOSI) The Museum of Science and Industry, Tampa, FL
The Museum of Science and Industry in Tampa, Florida, broke ground in 1977, and opened in 1982. There was an expansion completed in the summer of 1995, by architect Antoine Predock and local architects Robbins Bell and Kreher. The science center encompasses 254,000 square feet and 65 acres of land. Of that 65 acres, approximately 25 are dedicated to a wetlands park. Another 11 have been dedicated to the existing structure. Approximately 603,000 visitors visited the Museum of Science and Industry last year. MOSI’s space utilization is broken down into four major areas. There are 49,000 square feet of exhibition space, 5,000 of which is dedicated to temporary exhibits. Education and the MOSI Imax theatre encompass 73,000 square feet. Retail takes up another 7,700 square feet, and support consists of the remaining 100,300 square feet.

Case Studies 2

Salt Water Live, NOX Architects, Zeeland, Netherlands 1997

“The body simply creates a haptic field completely centered upon itself, in which every outer event becomes
related to this bodily network of virtual movements, becoming actualized in the form of movements.” “Liquid architecture is not the nemesis of natural fluids in architecture. First and foremost it is the liquidizing of everything that has traditionally been crystalline and solid in architecture. It is the combination of media.”

UFA-Cinema Center, Coop Himmelblau, Dresden, Germany 1998.

“A form of architecture arises that questions space as merely contained or containing objects, transposing that model into ‘space-time information’. The vitality of the movie image with its ubiquitous cultural presence is set adrift into a

Fig. 2 UFA cinema Center
complex layering of transparency and opacity- a ‘delay’ in glass.” “Here architecture offers itself not as a quantitative vacuum, but as an animate structure that destablishes cultural media.”

Project No.8910 Tokyo International Forum, Neil Denari, Tokyo, Japan

“It is in Tokyo where the new envelope of communicative transactions has been stretched to its thinnest possible dimension, a layer of thin air that is but symbolic of the disappearance of the object. And in its place: the continuing Spectacle of the image as experience which results in the brain-bank of overlapping images collaborating to produce several million individual dystopias.” “…Contemporary Japanese field of activity as being an open laboratory of experiments and possibilities. As technical facility supports the importation of radical ideas, it is possible to witness the changes to the
traditional cultural values of the country. Japan is in a perpetual state of newness.\textsuperscript{4}

New Metropolis Science and Technology Center, Renzo Piano, Amsterdam, Netherlands.

One of the key aspects of the mission of the New Metropolis is a ‘Kenniscentrum’-a place where people can come and interact with the world of technology that surrounds them. The institution aims to transfer information through technological means. The structure contains a 200 person interactive cinema, and a multi-purpose science theater, which may be utilized for demonstration plays and performances. The driving concept of the New Metropolis, as defined by its director, is prototyping for the 21st century.

All of the case studies outlined have similar conceptual ideas concerning the information age and the transference of this information to people. From these, further exploration will be made in the role of the computer with the development of these spaces.

Fig. 4 New Metropolis
Fig. 5 Interior view of the New Metropolis

Fig. 6 Interior view of the New Metropolis
SITE HISTORY AND SELECTION

Site

The aerial view (Fig. 7) of the MOSI site indicates the existing area and contents. Fowler Avenue running east and west borders the site on the north. Just north of this main artery is the University of South Florida with a newly built elementary school located directly across the street from the center of MOSI. The east and west sides of the site are bordered by two lanes of paved road.

Immediately to the south of the site is a Florida hammock along with wetland areas. Two blocks further south a single-family residential development begins.

The main frontage of the MOSI site is to the north, on Fowler Avenue, though there are other means of egress to the east of the site. Penetrating the northwest side of the land are functional railroad tracks that turn south through the site 300 feet within its boundary.

The land contains a variety of trees, shrubs, mainly oaks and palmetto bushes, and to the south of the site near the wetlands some pines and turkey oaks. The indigenous
wildlife consists of gopher tortoises, egrets, herons, pocket gophers, armadillos, and a variety of reptiles. The site on average is approximately 70’ above sea level and drains towards the wetlands.

**Schemes**

In Scheme 1 (Fig. 8), the new structure is located to the west of MOSI. This is an ideal location in terms of infrastructure such as parking and water main. The relationship of old versus new comes into mind with the placement of the future development in such close proximity to Antoine Predock’s Imax Theater, the jewel of Tampa. When his addition was in the planning stages, precautions were taken to allow for future development.

Therefore this scheme fits the site exceptionally well. Direct access to the second floor of Predock’s addition is shown here by the long linear connection. To properly respect the existing building and the view corridors it demands, the future development would step back from Fowler Avenue as it approached the Imax Theater (as shown).

Scheme 2 (Fig. 9) is situated on the northwest corner of the property bordering Fowler Avenue and 46th Street. As
in Scheme 1, this scheme addresses the view to the Imax Theater from along Fowler Avenue. The relationship between the buildings relates to the urban sprawl of the surrounding area of North Tampa. This scheme could be densified through useful interstitial land development creating a vital connection from the new to the old, urbanization/densification.

Due to the railroad tracks, expansion to the south would have to span the existing tracks, which creates an interesting design situation. This site warrants the development of a future mass-transit center because of its adjacency to a variety of existing, favorable conditions, e.g., a rail system that leads to downtown, frontage on two existing...
arteries, and its proximity to the 35,000 students who attend the University of South Florida.

Scheme 3 (Fig. 10) is similar to the second one, allowing for a variety of frontages hence varying the language and perhaps the usage.

Another scheme, not shown, is the redevelopment of the original building, which is to the west of Predock's addition. This would alleviate the urban sprawl, allowing for the centralization of parking and leave unobstructed the view to the Imax Theater from Fowler.

Concepts

The following concepts are extrapolated from Scheme 1. This scheme was chosen as the best option to densify and allow for future growth while continuing the timeline of architecture along Fowler Avenue.

The relationship between Concept 1 (Fig. 11), and the site

Fig. 11 Computer Plan of Concept 1

Fig. 11 Physical Model of Concept 1
is radial in nature, comprised of large linear elements which radiate off a centralized node. This node was mathematically derived through a series of calculations which utilized radians emitted from fixed points at the center of the existing Imax dome. The forms that radiate from the entry node tend to be large, linear and sleek in relation to Fowler Avenue. These forms break down and fragment as they move towards the south, firing residuals into the landscape. These fragments become events within the whole, influenced by the whole but individually experienced. Though apparently lost in a suburban wasteland, Concept 2 (Fig. 14) attempts to alleviate the situation by urbanizing/densifying the current conditions. Functions of the computer museum could essentially be separated through varied plazas and pockets. These oases of media-filled reality would be dispersed throughout the landscape. This matrix of structure could easily be developed and expounded upon, densifying the urban fabric. The forms arrange themselves by cradling a centralized auditorium and gathering space.
Their placements wind snake-like around the south side of the main space. The smaller scale forms being hide in the landscape of larger oaks.

Unlike the two previous concepts, that derive their form through two-dimensional mathematical calculations, the third concept (Fig. 16) utilizes the fourth dimension.
Similar to the NOX Architects’ FreshH20 eXPO in Zeeland, Netherlands, this form would interact with its inhabitants. The smooth form reacts to the interaction of the visitors, transforming the exterior of the building while informing the surrounding environment. The smooth, folded form glides, expands, and folds onto itself while the striated structure remains askew but stable. This technological masterpiece nestles itself within the
existing oak hammock. Only penetrating its protective surroundings to interact with the high-speed traffic to the north and pedestrian traffic elsewhere.

Focusing inward and to the south, this architectural massing (Fig. 19) deals with the high-speed vehicular traffic of Fowler Avenue through a series of contemporary projection screens. These
screens would have the capability to convey socialistic propaganda, subliminally infiltrating the craniums of mindless drones speeding towards their destiny. The screen towards the south would facilitate positive cultural experiences and higher learning.
DESIGN CRITERIA

Site Orientation

Upon analyzing the four separate parti, concept one was chosen for further development. Reasons governing this decision included the following. Proximity to the existing structure allows for the densification of surrounding area. Building to the west of the Museum of Science and Industry facilitated the development of a continuous edge condition along Fowler Avenue. This timeline of architecture and technology informs all of those who drive by of the development and progress made in the last quarter century. By concentrating the building against Fowler Avenue, and continuing the view corridor the I-max Theater deserves, the ability remains to create a pedestrian park to the south. Along with the pedestrian park, which includes an amphitheater, the project maximizes the amount of undisturbed, natural wetland area to the south. The parking quaintly resides within the electrical easement that divides the site from east to west. This in turn allows for the future development to the west along Fowler continuing our timeline, along with smaller scale, environmentally sensitive development to the southwest.

Through the consideration of the aforementioned factors the building begins to take its form. Utilizing the radians moving outward from a centralized node of the Imax Theater, view corridors were honored during the realization of the Computer Museum. These began with the view corridor from Fowler Avenue. Without jeopardizing the importance of the Imax Theater, the
initial, and most vital view corridor was established (Fig. 15). From here, other radians evolving from the center of the Imax Theater set up areas where “zones” or walls would be created emphasizing the concept of translucency and transmission of information through this area.

Thus we are creating a linear structure developed through a variety of issues. These issues included topics ranging from a concern with sun angles to the orientation and interaction with Fowler Avenue. The building, orienting itself along an east-west axis facilitates minimal heat gain during the long afternoon hours in the Florida sun. To harness as much of this free energy as possible, sun-shading devices/solar panels are installed within the large, five-story, atrium space and along the east sloping roofs. The orientation to Fowler Avenue was essential for the interaction of motorists with the building and its patrons. This interaction occurs through the penetration of zones throughout the structure via large video screens, walls, and windows.

Building Concept and Development

The building functions were designed in conjunction with the existing structures needs, and aim at accelerating cultural and social transformation. Each of these functions are individually expressed and articulated. Radiating from the atrium, which becomes the fulcrum of the new structure, levels of activity and varying densities evolve towards the west. Throughout the building, densities or translucency vary. All pathways ultimately lead the patron back into the transparent atrium space where one may
look out over the landscape at a variety of levels. Conceptually these levels represent degrees of translucency in relation to the patrons understanding and conformability with the technologies.

The first floor, being more labyrinth-like, leads you through the spaces. These spaces seem to surround you, enveloping you with technology. Allowing only a periodical glimpse of the outside world through the structure and technology, you become technology.

Ascending to the second floor through an escalator at the west-end, what was once opaque is now translucent. The degree of understanding and interaction is heightened. What was on the first floor as a sliver of light penetrating a space or hallway is now a larger window revealing the activated plaza to the south. Moving through the atrium to either of the theaters on the second floor, interactive zones truly do begin to form. While the pedestrian travels on people movers in one direction, images of automobiles speeding down Fowler Avenue flood the linear space in an opposing direction. These senses of confrontation are appeased through the understanding and further interaction with the moving automobile within this space. Vertical windows array themselves down the north façade of the building allowing for the visual connection for the participant. The connection of the car to the image is now understood. Coincided the automobile is now interacting with the building and its patrons. Large billboards become transparent zones, revealing function and program to the speeding automobile.
Ascending to the third floor through the atrium, one gains total understanding. Here, walls become transparent and structure is king. Views are abundant clarity is apparent. Functions in this space include conference rooms, multi-media laboratory, and virtual classrooms. This is also where a pedestrian walk from MOSI connects to the Computer Museum.

The fourth floor is reserved for administration but includes a roof–top garden and space to view the large screen within the amphitheater.

**Exterior Space**

Commentating on the hard edge and scale to the north, the building begins to break down and fragment towards the south. Relating to the human scale and Florida sun awnings radiate from the buildings second floor. Existing trees and southeastern wind help cool the plaza. This, along with the placement of additional trees, shrubs, and water elements will aid it the humanizing of the space. To help enclose the plaza the parking was placed to the south. Encompassed within the 4 story parking structure is a restaurant/lounge helping to activate the space at all hours of the day.
SOLUTION

Physical Model

Fig. 22 Concept Collage
Fig. 23 1st Floor Plan
Fig. 24 2nd Floor Plan
Fig. 25 3rd Floor Plan
Fig. 31 West Elevation
Fig. 32 View from the East
Fig. 33 View form the Northeast
Fig. 34 View form the Northwest
Fig. 35 View form the West
Fig. 36 View from the Southwest
Fig. 37 Computer Generated: Site Plan

1. elementary school
2. university of south florida
3. mass transit/big box retail
4. computer museum
5. museum of science and industry
6. smaller scale multi-use
7. protected wetlands park
Fig. 38 Computer Generated: Floor Plan 1

1 115 seat theater
2 escalator to 2nd floor
3 café
4 foyer
5 entry
6 amphitheater
7 parking garage
Fig. 39 Computer Generated: Floor Plan 2

1. video screen wall
2. 115 seat theater
3. 180 seat theater
4. retail
5. cantilevered awning
6. atrium
7. gallery space
8. exterior media screen
Fig. 40 Computer Generated: Floor Plan 3

1. research and development
2. media lab
3. double story meeting space
4. gallery space
5. balcony
6. entry form MOSI
7. water element
Fig. 41 Computer Generated: Floor Plan 4

1. clear story
2. administration
3. open to atrium space
4. roof top garden
5. path to future development
6. paved walkway
Fig. 42 Computer Generated Axonometric
Fig. 43 Computer Generated Axonometrics
Fig. 44 Computer Generated Exterior Perspectives

1. atrium
2. view of plaza from west
3. amphitheater
4. parking garage
5. view of plaza from east
6. amphitheater
7. main entry
Fig. 45 Computer Generated Sections
Fig. 46 Computer Generate Section

1 glass atrium
2 vertical circulation
3 interactive gallery
4 plaza
5 foyer
ENDNOTES


2 Riewoldt, p. 8.


BIBLIOGRAPHY


