CHARLES AND RAY EAMES’S MULTISCREEN EXHIBITIONS:
Cybernetic Visions of Computing, Communication, Complexity, and Control

[ A Design Primer For Re-“THINK”-ing The American Century ]

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Abstract

The American Century denotes a period of U.S. political, economic, and cultural dominance in the twentieth century that reached its height in the middle of the century after World War II and before the Vietnam War. Midcentury America is an artifact in our contemporary time, popularly invoked by politicians and ubiquitous in the vocabularies of contemporary aesthetics. Focusing on the midcentury designers, Charles and Ray Eames, this thesis examines the role of design in articulating, navigating, and reacting the emergence of the Information Age, the Cold War, and the Postmodern condition.

Beyond providing the material objects that constituted the midcentury world, Ray and Charles Eames abstracted the problems plaguing twentieth-century America and designed its solutions. The computing and systems revolution that occurred as a result of the war, led to an influx of data, a feeling of complexity, increased specialization, and the development of tools to manage this fracturing.

Viewing design as one of those tool, Ray and Charles Eames developed their Multiscreen exhibitions as a new tool for seeing, training viewers to make decisions using methods of designs for abstracting, structuring, and solving increasingly complex problems.

The designers’ tools of vision and communication led to a redefinition of the role design historically played. The Eameses multiscreen technology and their three exhibitions – *A Sample Lesson* (1953), *Glimpses of the U.S.A* (1959), and *Think* (1964)- serve as a locus to piece together intersecting histories, exposing the contending ambitions, techniques of vision, and technologies of control and freedom. The development of the multiscreen tool for pedagogy, manipulated as a tool of persuasion employed for cultural diplomacy, and co-opted by an emerging technocracy, mirrors the expansion and recasting of the designer.

In providing a structural, systems-based, intellectual and design history, this thesis hopes to recuperate the evolutionary and historical processes of regulation, reactivity, and interactivity. These processes in turn help form the current market, driven by attention as currency and design as interactive, evidenced by the ubiquity of screens and saturated media landscapes as well as current cultural, technological, and economic obsessions with data. Within this narrative, design interrogates practices of objectivity, knowledge/power, identity, and history-making, fundamental to philosophies of technology, history, and human experience.
Acknowledgments

Eventually everything connects - people, ideas, objects. The quality of the connections is the key to quality. – Charles Eames

In many ways this project, the process that it entailed, and the content, reflect my complete experience over the course of four years at Haverford as a History major and Neuroscience minor. An experience that I am grateful for being gifted with as I am forever indebted to my parents and family in their continued and tireless support. This thesis took many forms over the years, from Victor Gruen and his malls to Walt Disney and the Postmodern, I am grateful for the experiences that led me to pick such an edifying topic.

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- Make a list of books
- Develop a curiosity
- Look at things as though for the first time
- Think of things in relation to each other
- Always think of the next larger thing
- Avoid the “pat” answer—the formula
- Avoid the preconceived idea
- Study well objects made past recent and ancient but never without the technological and social conditions responsible
- Prepare yourself to search out the true need—physical, psychological
- Prepare yourself to intelligently fill that need

The art is not something you apply to your work
The art is the way you do your work, a result of your attitude toward it

Design is a full time job

-Charles Eames
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Introduction

Don’t be like I was. Don’t be afraid of history. Take all of it you can get.
-Charles Eames
We now have a moment in time which is very precious,” says Eames, “but this is
valid only if the toy does nothing.” “And this, I would say would be a good test for
any design. Does it make somebody aware of something that it is important for him
to be aware of? And does it do it in a manner that is delightful (which is the
opposite of pedantic)? In fact, this could be a good starting point for somebody
wanting to make a design: to think first about what he wanted to make people
aware of, and then to move toward the most effective and pleasing way of bringing
this about.1 - Charles Eames (1959), regarding his solar, “Do-nothing machine”

**Designing A “Do-Nothing”: Toys, Utility, and Pleasure**

This thesis and what it is about may be nothing more than a “toy.” After all, the
narrative I’ve assembled is in large part about two famous toymakers and one of their
favorite toys that they designed. However, on a philosophical level, this thesis asks the
reader ‘what is a toy,’ ‘what does a toy do,’ and lastly ‘how are toys helpful for our
historical understanding.’

A “toy” in its simplest terms refers to an object that a child plays with. In other
ways, the word “toy” connotes something that is simple-minded or perhaps even
pleasurable. The common expression used in classifying an object that is not a toy, a
“toy,” reveals the personal and societal disdain for anything that lacks utility, and is
simply for one’s leisure and pleasure. However, what one fails to understand when they
mockingly call something a “toy “is that a toy, like many other objects, is always an
object of design.

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Furthering this line of inquiry regarding toys, my thesis asks the reader, ‘what is design, what does design do,’ and lastly ‘how is design helpful for our historical understanding.’

Most people conflate the discipline of design with arts or crafts. While both disciplines are inextricably tied to each other, they are not simply interchangeable terms. On a theoretical level, both art and design have a mutual appreciation for aesthetic theory, respond to human fantasies through materials and form, and ultimately rely on an intensely cultivated visual vocabulary and intuitive sensibility. Despite the persistence of this misconception, design, unlike art at its most rudimentary form, has utility.

Despite fundamental differences, historical accounts of design are often no different than a history of art. In historicizing their narratives, the history of art and the history of design is at its worst a one or two-dimensional history of objects, their makers, and their users. The result of which leaves the discipline of art and design as pedantic, regarded as being academically less rigorous, and lacking serious [read political and economic] implications. It is through this historical project that I hope to produce a proper history of design by treating objects as systems. A rigorous history of design should expose the designed form as multidimensional. As an interface, a design object provides the historian with an accessible narrative and material evidence of historical relationships and awareness. Design becomes representative of a socially symbolic act, imbued with motives and philosophies, and negotiated and experienced at various levels of stakeholders. As a locus of study, a design history brings into focus structural, cultural, intellectual, and personal histories.
Simply, my thesis is about Ray and Charles Eames - arguably the most famous American designers of the twentieth century. The Eameses’ 1946 bent plywood chair, their 1950 fiberglass chair, and their 1956 lounge chair and ottoman are heralded as “the greatest design [s] of the 20th century”. Their chairs and furniture have become ubiquitous symbols of midcentury design, successfully accompanying aesthetic satisfaction with comfort. These designs are still found in many households around the world today, persisting against the changing forces of fashion and style, prompting the question, “When will midcentury modernism die?”.

While most people come to know the Eameses through their furniture, their work spans multiple disciplines including architecture, toys, film, lighting design, graphics, museum displays and even international exhibitions. Employed by academia, the state, and industry, the Eameses produced the designs of the leading stakeholders of the American century. Many of their works are still preserved in the memories of most baby-boomers, as they help shaped the everyday experience for the majority of Americans, and ultimately came to define the postwar American identity.

Historians that broadly study the subject of leisure are often unanimous in their appraisal of mid-century America as perfecting the circulation, demand, and satisfaction of material culture dedicated to public forms of pleasure and happiness.

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The extension of the pleasure principle, once reserved and elusive, was rendered accessible to common-folk during rapid industrialization and the rise of modernity.

**Charles and Ray Eames**

The Eames Office on 901 Washington Boulevard in Venice, California was the site of production for the Eames design, and consequently a laboratory for the first half of the American Century. Their office provided the functional model for Disney’s Imagineers, Google’s open working environment, and a host of other design and technology driven startups in the 21st century. To fellow designers visiting The Eames Office ‘was like visiting another world, ” while others regarded it as “Fairyland” or a “True Designer’s Heaven.” The overcrowded warehouse garage, adorned with preliminary sketches, colorful musings, past designs, and equipped with photography labs, film sets, extensive libraries, archives, production spaces, and screening rooms captures the imaginative breadth and intensity of Charles and Ray.  

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*Figure 1: Charles and Ray Eames working in their office.*

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Ray was formally trained as a painter under the tutelage of the famous modernist painter Hans Hoffman, and always maintained that she “never gave up painting, she simply changed [her] palette.” Charles trained as an architect. Time and time again, interviewers naively pressed Charles as they struggled to understand how the Eameses could possibly design a chair and also buildings, and Charles would simply answer, “everything comes after the heading of architecture, whether it’s chairs or space platforms. Everything. [Even dresses?] By all means. They have structure.”

Rather simply, the Eameses as designers were not constrained to a myopic view of architecture or a single palette. Despite this optimistic and intense belief in architecture, Charles failed to graduate architecture school. Allegedly, the administration at the University of Washington in St. Louis asked Charles to leave due to Charles’ frequent requests to study Frank Lloyd Wright, an up and coming, modernist architect at the time. The school deemed these request as subordinating the Beaux Arts craft dominantly taught in the United States in favor of a new, vulgar modernist impulse.

Charles stated, “my grandfather was born in the 18th century, my father in the 19th century, and I was born in the 20th century.” Beyond pure autobiography, Charles and Ray are thought of in all senses “modern.” Modern design, also known as the Modernist Movement or more simply, as “Modernism characterizes a stylistic

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8 Charles Eames, Oral History, interview by Virginia Stith, St. Louis Department of Parks and Recreation, October 13, 1977, Eames Office LLC. Archives.
period beginning as a result of the Second Industrial Revolution, maturing during the interwar and midcentury, and based on one’s school of thought has yet to end its stylistic dominance. As a shorthand, Modern design realizes an aberration from tradition towards a technologically optimistic future, inspired by the machine aesthetic and the industrialized environment of the interwar period, and exemplified in pure, geometrical, and austere aesthetics.  

The Modern Design Movement

In 1925, The Paris Exhibition showcased advancements of European modernism to more than sixteen million visitors. Despite the United States’ rapid industrialization, production of goods, and economic success, it still lagged behind its European counterparts as an aesthetically modern nation. When invited to the Fair, Secretary of Commerce, Herbert Hoover declined, stating that the “United States had no examples of modern design.” American modern design – still in its infancy – sought institutional support through museums, and in 1929 New York City’s Museum of Modern Art was founded to promote American modernism by advocating for the production and display of American mass-produced products. In 1932, the MoMA-sponsored Henry Russell Hitchcock and Phillip Johnson to curate the now famous “Modern Architecture: International Exhibition,” which introduced the American public to the International Style and the Bauhaus tradition represented in the works of Le Corbusier, Mies van der Rohe, J.J.P Oud, and Walter Gropius. During the 1930s, Gropius and his colleagues

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10 Ibid.
fled Hitler for America. In re-establishing themselves in schools across the nation, Gropius and Bauhaus members modernized the American curriculum, advocated for a more intimate relationship with the designer to industry, and inspired a new generation of designers prominent in the 30s, 40s, and 50s.11

**The Rise of Industrial Design**

Increased competition during the economic depression of the 1930s organized an American industrial world to look seriously at design as a means of selling products. As a result, a new vocation, known as industrial design, was formed. Among the earliest American industrial designers were – Raymond Lowey, Walter Teague, Henry Dreyfuss, and Norman Bel Geddes. Their visual and technical skills were applied to the world of commerce as generalists rather than specialists; as a result, they stylized some of the most well-known, household products, effectively becoming popular figures in American culture. However, modernism and industrial design had not reached its zenith in America until it took over New York City in 1939. New York City hosted the World’s Fair, promising over 44 million fairgoers a “World of Tomorrow”; a vision of the United States emerging from the Great Depression powered by the fruits of modernity: science, technology, and modern design.12 Displaying the most innovative ideas and styles of the International and Bauhaus traditions, the Fair perfected a collective enthusiasm for scientific rationality, technological progress,

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11 Ibid.

modernist aesthetics, industrial design, consumer prosperity, and corporate capitalism.  

**Organic Design Competition**

A year later, America would enter World War II, and the “World of Tomorrow” looked strikingly like a nightmare from the past. A few months before Pearl Harbor, Eliot Noyes, the first curator of the MOMA’s Department of Industrial Design, launched a nationwide competition for the design of furniture, fabrics, and lamps. The contest tasked designers with creating a better environment inspired by the new needs and aesthetic requirements of the modern age. More than 585 entries were submitted, but it was the team of Eero Saarinen and Charles Eames, two young architects and teachers at Cranbrook Academy, who captured the attention of Noyes and the judges. The pair took the two most coveted categories—living room and chair design. The award-winning design was a concept of a plywood chair with a three-way curve laminated shell and rubber welds. The designer’s ambition was to produce a comfortable chair that was only austere in its substance and would be an attractive, low cost, and dignified product of mass production.  

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13 Shannon Mattern, "Indexing The World Of Tomorrow" (2016).
After selecting Eero and Charles’ ergonomic chair as the winner of the competition, Noyes renamed the competition after its *Organic Design*, including a quotation from Lewis Mumford’s *Technics and Civilization* in the introduction to the competition’s subsequent publication:

> Our capacity to go beyond the machine rests in our power to assimilate the machine. Until we have absorbed the lessons of objectivity, impersonality, neutrality, the lessons of the mechanical realm, we cannot go further in our development toward the more richly organic, the more profoundly human.15

**An Eamesian Approach to Design**

Emerging as champions of ergonomics and nationally recognized designers, the Eameses designed their organic chair not trying to “solve how people should sit, but rather accepting the way people do sit.”16 The structure of the chair was not an image

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16 Charles and Eames Ray and Eames, “The Development of the Molded Plywood Chair” by the of Office of Charles and Ray Eames, 16mm. 1953
or object, but rather an interface imbued with philosophical ideals and a connected system of relationships. As such, design for the Eameses was “a plan for arranging elements in such a way as to best accomplish a particular purpose.” Critical to the Eameses’ process of design was the development of an artistic sensitivity or vision that they believed would allow the designers the power to discriminate and parse out the essential elements of a problem to create an emergent structure of concepts, patterns, and relationships, and inevitably a solution. The impetus behind their designs can be understood as categorized by two motives: either an unbridled enthusiasm of wanting to do something for a long time that they could not delay any longer; or a logical extension of some immediate problem they identified and were working to solve.  

Intensely aware of the mutual relationship of utility and pleasure achieved through design, as well as the overlapping interests and concerns of the designer, its employer, and the society. Charles and Ray Eames often rebutted the societal apprehension of pleasure by asking “who would say that pleasure is not useful?” Together, they made the name Eames synonymous with creative ingenuity, playfulness, discriminating taste, variety, and as a signifier for freshly modern designs. In the spotlight of a camera, or at the lectern at a university, or on the title of his eponymous MoMA exhibit, Charles was often placed front and center as the creative

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17 Charles Eames, design drawings and statement for “What Is Design?” August 29, 1969, Eames Office, LLC Archives, Santa Monica, California.


genius. And while Ray often shied away from the cameras, quietly taking her position behind Charles, only until Charles would quip, “Whatever I can do, Ray can do better.” Together they brought each other’s concepts to life, giving them form. Together they took their “pleasure seriously,” as play became an opportunity for learning or a method for problem-solving. Design—to them—was a process of life.

Perhaps it was this distinctly Eamesian approach to design that led Charles and Ray to develop a new technology for seeing. Augmented forms of data, fragmented visions of media, intensified networks of information and communication, and increased complexity associated with the rise of Information Age, led to the inception and development of a multiscreen technology featured at the University of Georgia in 1953, the 1959 American National Exhibition in Moscow, and the 1964-65 New York World’s Fair.

**Literature Review**

Often understated or totally forgotten in architectural canon, exhibition histories, and even personal biographies of the Eameses, the treatment of the Eameses’ multiscreen exhibitions are primarily limited to two words: “information overload.” Despite being one of Charles and Ray’s favorite and most used applications of design, the multiscreen exhibitions have been monolithically grouped together by the historians who have written about them. It was only until the last

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decade that the multiscreen exhibitions were re-discovered as a site of historical significance. Even when critically examined, the narratives and histories produced are limited, most scholarship limits itself to a single episode in which Charles and Ray employed the multiscreen method. In addition to failing to present a holistic account of the Eameses’ multiscreen exhibitions, Charles and Ray’s intellectual progression and development, an analysis of the formal developments featured in each multiscreen iteration, as well as the lasting theoretical implications that played out in the second half of the American century are absent. Current cultural, technological, and economic obsessions with data, the ubiquity of screens and saturated media landscapes, and a new market driven by a currency of attention and calling for design, interrogate the multiscreen narrative.

My thesis intervenes on Charles and Ray Eameses’ legacy as midcentury modern designers by presenting their work as a continuum that bridges pre-war modernism to postwar modernism and postmodernism. Furthermore, the history of these multiscreen exhibitions provides an accessible object, site, and moment to understand the ontological turn from modernity to postmodernity. No scholarship known to the author has situated the Eameses or the multiscreen exhibitions within the redefinition of design and the role of the designer during the American century or contextualized in the modern and postmodern dialectic. One account cursorily draws attention to the Eameses and their multiscreen technology within a similar context of the postwar development of cognitive science and Gyorgy Kepes’ theories of vision.  

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Methodology and Thesis Overview

Building on a diversity of scholars, primary sources, and related intellectual histories and critical theories, this thesis attempts to show how the Eameses and their multiscreen exhibitions punctuated a distinctly innocuous design aesthetic, movement, and moment in American history. In constructing this narrative, I purposely employ design and systems terminology. In doing so I am attempting to articulate evolutionary processes of regulation/control, response/reactivity, and feedback/interactivity that is part and parcel of Modernity, the American Century, systems theory articulated at this moment and incredibly influential to practices of design, particularly the Eameses designs.

In light of earlier treatments, I organize my thesis in four subsequent sections. I present the Eameses from WWII to the mid-1960s as integral actors in the postwar ascent of data, design, and digital technology: Section II “Data Driven”; Section III “Design Obsessed”; three parts of Section IV “Digitally Imagined”; concluding with Section V “A Postscript on Control Societies.” In addition to articulating these three stages—“Data Driven, Design Obsessed, and Digitally Imagined”---of modernity, I trace the professional evolution of the American designer, and the changing role design plays in the American Century.

I focus on three case studies that trace the origin, development, and legacy of the Eameses’ multiscreen exhibitions. The first section begins immediately following the Eameses’ success at the Organic Design competition and the outbreak of the
Second World War. While the war delayed the implementation of their designs for plywood furniture, a need for industrial solutions led to the development of data processing, communication theory, cybernetics, and the designer’s role as a general problem solver. Addressing the anxieties of the modern American condition and the historical influx of data, the Eameses developed the multiscreen technology as an efficient means of communication and pedagogy as A Sample Lesson.

The postwar period, mapped out in the second section, charts the development of a domestic consumer society, the use of design for political means, and the repositioning of design, the designer, and the Eameses as central to mid-century American culture. The elision of political beliefs and design culminates in the diplomatic efforts of the US Government at the Moscow exhibition in 1959, and the use of the Eameses’ second multiscreen performance as a political tool for ideological control and psychological warfare.

Lastly, I focus on the Eameses involvement with International Business Machines (IBM) and present the 1964-1965 New York World’s Fair as a locus for a building tension between control and freedom during the American century. The Eameses multiscreen film Think displayed at the IBM Pavilion models a nascent postmodern, pluralistic American identity, and allows one to investigate the contemporary human experience, a priori of a digestible history, and how the Eameses technology gave spectators a glimpse of the future.

Ultimately, the purpose of this paper is to advocate for design as a cognitive strategy complimentary to any discipline, and particularly useful in the project of history. Moreover, if I am to accomplish anything at all, I hope to at least adequately
demonstrate Charles’ notion that, “toys are really not as innocent as they look. Toys and games are preludes to serious ideas.”

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Beyond the age of information is the age of choices.
Charles Eames
On January 8th, 1942, Eliot Noyes wrote to Charles Eames, “the whole project seems to be dribbling off into nothing because of [war] priority pressure; no more rubber, no more plywood.” Less than a year after the Organic Design competition winners were announced, and a month after the attack on Pearl Harbor, America was engaged in a second great war, which meant there was little to no hope Charles’s chairs would ever reach the production line. Despite the incredible constraints the war prescribed its citizens, it was also a great source for opportunities that would come to define the postwar years. Challenges of a modern and total war demanded the development of a military-industrial-academic complex to fund, develop, and employ data driven and design based technological solutions. The Second World War gave Charles and Ray an opportunity to continue their plywood experiments, while allied scientists invented the digital computer accelerating the inception of the information age, which ultimately recast new problems needing technological and design solutions, like the Eameses first multiscreen presentation.

**Computing Data-Driven Solutions**

In 1943, Alan Turing created the machine known as “Colossus” to automate the decrypting process of the German cipher machines, known to allies as "Enigma," in doing so, Turing invented the first electronic computer, which eventually led to the Allied forces success over the Axis powers. Deploying large amounts of national resources to fund intellectual communities, industrial solutions, and scientific

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advancements proved largely successful. Vannevar Bush, director of the development-oriented, Office of Scientific Research and Development (OSRD), convinced President Roosevelt that close ties between the government and scientists would be critical to the war. Bush organized the Manhattan Project and oversaw the work of 6,000 civilian scientists responsible for the largest science and engineering projects of the war. In July 1945, Bush penned his influential report, “Science: The Endless Frontier” — conducted at the request of President Roosevelt but delivered to President Truman, that gave a vision of the future of Science and the American Century, one that would give rise to the military-industrial-academic complex. The expansion and collusion of military and industrial research labs at America’s prominent universities defined “the critical problems for the postwar generation of American scientists and engineers,” reshaping scientific disciplines and university environments. Later in 1945, America made progress with its first electronic computer, ENIAC, effectively pushing the zeitgeist toward data-driven technologies and giving rise to the Information age.

Universal Design-Driven Solutions

During the war effort, Charles and Ray relocated from Cranbrook to California as a newly married couple, struggling to find the means to live and operate their design firm. Charles’ furniture designs remained impossible in a manufacturing setting, and materials were increasingly scarce. Auspiciously, Wendell G. Scott, an acquaintance of Charles’s from St. Louis and a doctor with military ties, visited the young couple at

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their new West Hollywood apartment. During his visit, Dr. Scott casually mentioned to Charles that the regulation metal splints used by medical corps to brace injured servicemen caused more damage to the wounded soldier than a makeshift brace. Seeing a design problem, Charles immediately pursued its solution. Charles adapted his experiments with furniture to develop a molded plywood leg splint, and by the summer of 1942, the US Navy placed their first order for 5,000 splints. In 1943, Charles solicited Colonel Edward S. Evans, the head of a Detroit-based manufacturer and lumber supplier, to produce and distribute the Eameses’ splints. As ‘Director of Research and Development’ for the Evans Company’s Molded Plywood Division, Charles expanded operations to 901 Washington Boulevard in Venice, Los Angeles, which would later become the site of the Eames Office. Throughout the duration of the war, ‘The Molded Plywood Division’ experimented with plywood gas tanks, full-body litters, wheel doors, hinges and structural angles, molded-plywood pilot seats, various aircraft parts, and the nose of the CG-16 “Flying Flatcar.” By the end of the war, the Eameses had manufactured over 150,000 plywood splints for the Navy. 28 In addition to the lessons learned through the years of experimenting with plywood as a military technology, Ray’s sculptural musings with plywood contributed to a new knowledge of the material and form, renewing Charles and Ray’s ambition to mass-produce simple, low-cost, high-quality designs. 29

The Rise of the Information Age

As the Eameses’ organic plywood designs were beginning to be mass-produced, the Machine Age shifted to the Information Age. The recasting of the designer’s role as an industrial designer and marketer before the war to that a problem solver providing generalized, systems-based solutions enabled Charles and Ray to imagine new problems challenging academia, government, industry, and society in the Information Age. The rapid expansion of data, the growing complexities of machines, structures, and relationships, coupled with widening disparities among ideologies and pedagogies, contributed to a collective perception of the modern world as increasingly complex.\(^{30}\) This apparent complexity was characterized by an exponential increase in technological complexity and a resulting intensification of data collection and analysis. The problem, the Eameses and his contemporaries diagnosed, was the increasing quantities of data and the lack of a generalized response or tool to manage this increase. Compounding this problem were augmented demands for managing data,\(^{30}\)

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\(^{30}\) Whether or not this phenomenon was a wholly new problem, is not historically relevant. While the relative similarity to other historical moments does not discount the experience, the writings of specialist and lay people respond to this experience of an increasingly complex world.
divided occupational tools and skills to respond to the inundation of fractured data, and a widening gap of discontinuity between knowledge and communication needed to solve problems productively and efficiently. This problem was perceived to be a consequence of dividing labor for optimal productivity, a common practice of Taylorism that began during the Industrial Revolution and continued to be promoted by America’s leading capitalists.

In separating the laborer from his product in the machine age, industry separated practice from insight, imagination, and execution. The result led to the emergence of the specialist and the practice of expertise knowledge. The Military-Industrial-Academic Complex reshaped institutional priorities and structures, advocating for the education of specialists. Separation continued as specialized institutions unintentionally trained its professionals to possess atomistic vision, leading to a further separation of the scientist and the businessman.31

Ironically, specialization during the war and extended by Bush’s military-industrial-academic Complex not only furthered these discontinuities of communication but also generated scientific interest in the process of communication. The speed of military operations greatly increased, and it became clear that that human decision and judgment and the communication speed of human organization was unable to cope with the pace of modern warfare.

Algorithmic Theories of the Information Age

A young mathematical prodigy, Claude E. Shannon worked on anti-aircraft directors, secret communications system, and the theory of cryptography, during the war. Seemingly influenced by his applied work, Shannon published a two-part article in the Bell System Technical Journal theorizing his Mathematical Theory of Communication in 1948. His theory turned out to be not only an integral tenet of information theory and a central text during the dawn of the information age but a continual source of inspiration for Charles Eames. Shannon’s paper, along with Warren Weaver’s explication of Shannon’s information theory, sketched an outline of a general communication system consisting of a message that originates from a source, which enters as input into a transmission device, and is encoded and transmitted across a medium as a signal. During the process of transmission, the signal is sent along a channel that encounters “noise.” The received signal (transmitter signal plus noise) enters the receiver, which decodes it and converts it into a message for the destination.

The Shannon-Weaver Mathematical Model, 1949

![Shannon's Mathematical Communication Theory Model](image)

Figure 3: Shannon's Mathematical Communication Theory Model

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However, Weaver felt Shannon was too cautious in excluding semantic considerations from his theory, stating that communication could be analyzed as a hierarchy of three problems:

“Level A. How accurately can the symbols of communication be transmitted? (The technical problem.)

Level B. How precisely do the transmitted symbols convey the desired meaning? (The semantic problem.)

Level C. How effectively does the received meaning affect conduct in the desired way? (The effectiveness problem.)” \(^{33}\)

Norbert Wiener presented an even more comprehensive theory of systems than Shannon or Weaver in his popular 1950 book titled *Cybernetics*, in which he defined cybernetics as the “entire field of control and communication theory, whether in the machine or the animal.” \(^{34}\) At the same time as Claude Shannon, Norbert Wiener was developing distinct theories of communication and control. Commissioned by the National Defense Research Committee and Shannon’s mentor, Vannevar Bush, Wiener was tasked with designing a device that could calculate the trajectory of an enemy plane and direct a gun to shoot it down. In relating human operators to links in the control systems of planes and anti-aircraft directors, Wiener postulated that humans

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and machines could be analyzed using the same formalized principles of communication and control. Advancements in Cybernetics and Systems theory led to further abstractions of its principles, moving beyond the realm of technical and semantic solutions, and were applied to everything from science, engineering, and industry to issues related to pedagogy, government, and society.\textsuperscript{35}

**Design Theories of the Information Age**

As a result, Charles Eames became intensely interested in communication and systems theory, as promising solutions that overlapped with design and for application to problems typically involved in architecture and urban planning. Consequently, in 1953, Charles began working on two multimedia presentations “Communications Process” and “Communications Methods.”\textsuperscript{36} Charles and Ray edited these two presentations into their first well-known film, *A Communications Primer*. The twenty-two-minute film discusses the broad meaning of communications by presenting contemporary theories of information and communication processing with everyday abstractions and examples. The Eameses similarly elide the human body to a machine echoing Wiener’s theory in *A Communication Primer*:

> As flowing as human movements may seem, they are actually the product of these countless yes/no decisions communicated with great speed to and from all parts of the body. The channel is the nervous system. Each nerve is made up of hundreds


\textsuperscript{36} Ray Eames, Marilyn Neuhart and John Neuhart, Eames Design: The Work Of The Office Of Charles And Ray Eames (London: Thames and Hudson, 1989) 183.
of fibers. The decision is the impulse of a single nerve fiber, an all-out event, a trigger process, which is set off like an explosion when the stimulus exceeds the ignition point. The dot in the half-tone, the hole in the tape - each is a separate fire/no-fire signal, but together they add up to a smooth, sometimes incredibly complex action that often seems more vague than decisive. Yet, many things that we accept as undecided vagaries would be, if we could bring our focus in sharp, decisive individual units. It is the responsibility of selecting and relating parts that makes possible a whole, which itself has unity.37

Unity in this increasingly fractured world was not found at a liberal arts college, but rather at the Eames Office. The designer, newly-defined with an all-encompassing identity as an artist, an industrial designer, and a systems-based problem solver, possessed the necessary tools to decrease discontinuity. Once isolated from the Western world in past centuries for their lack of utility, the artist’s tools as a visionary and communicator could theoretically change discontinuities as coherent wholes. In their isolation, the myth of the artist grew, as only a select few of society were endowed with the necessary genius for art and design. However, the historical re-assimilation of the artist back into society through the advent of Industrial Design in the early twentieth century enabled the perception that design was necessary. As specialists and generalists, tasked with visualizing and communicating as an interlocutor between industry and consumer, the designer, and the practice of design were seen as palliative and necessary for the challenges facing the Information Age and American Century.38 Pursuing the solution to the challenges of the information age, Charles and Ray produced their multiscreen presentations, first debuting in 1953 as the form of a hypothetical course, titled A Sample Lesson.

A Hypothetical Course

In the summer of 1952, George Nelson’s phone rang; on the other end of the telephone wire was Lamar Dodd, chairman of the University of Georgia’s Fine Arts  

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Department. A world famous American designer, Nelson refused Dodd’s persistent offers to host him in the oppressively hot Athens, Georgia, in exchange for a lecture. Two days later, the phone rang, and once again Lamar Dodd’s voice came over the receiver, this time offering Nelson, a position as a consultant to the faculty regarding educational policy. Nelson insisted, "Nobody could possibly know less about educational policy than I know," and Dodd quickly explained, "That’s why we want you."39

That summer Nelson toured Georgia’s art school finding what anyone would expect: “courses in theory, classes in drawing and painting, classes in design, craft workshops for weaving, screen painting, ceramics and so on.” However, he noticed a distinction between two groups of art students: laywomen who believed these courses would presumably help them as future homemakers, and a smaller percentage of undergraduates looking to establish careers in the arts. Despite their different ambitions, these two groups of students were instructed in the same manner.40

In the fall, Nelson invited Charles Eames to form a small advisory committee. While touring the school, Nelson and Eames observed one art class finish a two-week exercise, a lesson that would have taken a physics class five minutes to demonstrate with a simple apparatus. The two designers concluded that teaching effectiveness could be evaluated based on time, where the shortest time taken to communicate a lesson – without loss of comprehension or retention- represented the best method.

Noting the department’s confusion as to its methods and objectives, Eames and

40 Ibid.
Nelson probed into larger questions about whether the traditional method of art instruction was being used because it had always been used. Reconciling inefficiencies in teaching, Nelson and Eames came to the realization that the real objective of the art department was "to foster understanding and creative capacity so these qualities could be employed in any situation," and this instruction could be done more efficiently with new industrial means.41

The faculty responded negatively to the seemingly innocuous proposal, fearing automation, unemployment, and the erasure of the individualized instruction as well as student-teacher relationships altogether. The very night Nelson and Eames were scrutinized for their findings, they planned a proposal that would quell misplaced fear and provide a solution to the department’s problem. The following day they proposed that they would present a specific example of their thinking in the form of a sample lesson for an imaginary course.

Nelson and Eames invited Alexander Girard, another world-famous American designer, to help the project. After acquiring funding from the Rockefeller Foundation, the designers began to produce “A Rough Sketch for a Sample Lesson for a Hypothetical Course” – or more simply “A Sample Lesson or Art X” (a prescriptive title referred to by George Nelson). The presentation would become the first public multimedia presentation in the United States.42

41 Ibid.
**A Sample Lesson (1953)**

The three designers returned to Athens with a 16mm projector handling both film and magnetic sound, several tape recorders, three slide projectors, three screens, cans of film, boxes of slides, reels of magnetic tape, and Girard's collection of synthetic smells. The first performance of Art X took eight people with an estimated cost of $100,000,000 -projected for the production of an intensive full-course. The hour-long lecture inventively employed high-speed techniques for exposing relationships between seemingly unrelated phenomena using film, slides, sounds, music, and narration.

George Nelson recounts the experience of the multiscreen, multimedia performance:

A slide goes on the screen, showing a still life by Picasso. A narrator's voice identifies it, adds that it is a type of painting known as "abstract," which is correct in the dictionary sense of the word since the painter abstracted from the data in front of him only what he wanted and arranged it as he saw fit. The next slide shows a section of London. The dry voice identifies this as an abstraction too, since of all the possible data about this area, only the street pattern was selected. Then follow other maps of the same area, but each presents different data-routes of subways, location of garages, etc. The voice observes that each time the information is changed the picture changes. The camera closes in on the maps until only a few bright color patches show; the communication is now useless to the geographer, but there is something new in the residue of colors and shapes. Then a shift to a distant view of Notre Dame, followed by a series, which takes you closer and
closer. The narrator cites the cathedral as an abstraction— the result of a filtering-out process, which has gone on for centuries. The single slide sequence becomes a triple slide projection. Simultaneous exterior views change to interior views. Organ music crashes in as the narration stops. The interior becomes a close-up of a stained glass window. Incense drifts into the auditorium. The entire room dissolves into sound, space, and color.\textsuperscript{43}

\textbf{Figure 5: A Demonstration of A Sample Lesson}

The auditorium seats quickly retracted as magnanimous applause broke the awesome silence. Hollywood producers stood at attention, excited by what they had just seen, and impious college students unfamiliar with incense ran to the exit, fearing the chemistry building was up in flames. The football team’s linebackers blitzed the

three designers, exclaiming “All teaching should be done like this! Why didn’t anyone
tell me - I thought this was just another art lecture?” Later, Nelson claimed that the
“Sample Lesson produced both confusion and enlightenment, generated enthusiasm
and hostility.” Six performances of the Sample Lesson were given at the University of
Georgia in January 1953, and three more presentations were given five months later at
the University of California, Los Angeles, sponsored by the Department of
Engineering.

Origins of the Multiscreen

The origins of the formal techniques used in A Sample Lesson to expand the
audience’s vision were inspired by early-twentieth-century innovations in modernist
exhibition design and experimental film, two traditions concerned with the expansion of
vision through artistic means. Produced in the same year as A Sample Lesson, George
Nelson’s book Display devotes a lengthy chapter to modern techniques and designs of
exhibitions. He devotes a dozen pages to the work and innovation of Herbert Bayer, an
Austrian Bauhaus designer who immigrated to the United States in the 1930s. In these
pages, he particularly focuses on Bayer’s impact on the concept of the field of vision.
Recognizing the dynamic mobility of the eye, Bayer contributes to modernist exhibition
design by expanding the line of a spectator’s vision from a horizontal plane to an

45 Ray Eames, Marilyn Neuhart and John Neuhart, Eames Design: The Work Of The Office Of Charles
And Ray Eames (London: Thames and Hudson, 1989),185.
immersive view of his environment (See Figure 6). Nelson particularly cites Bayer, Gropius, Breuer, and Moholy-Nagy’s 1930 Werkbund exhibition in Paris that used angled and mounted panels to produce a three-dimensional quality to facilitate viewing and focus the spectator’s attention (See Figure 7).

Concurrent with these innovations in exhibition design was the new technical expression of experimental film. Artists drew on color, shapes, overlays, movement, music, and mechanical engineering to animate performances and induce novel sensory effects, free-association, and heightened perception. Renowned experimentalists like Oskar Fischinger, Curtis Harrington, Wallace Bernan, and the Whitney Brothers moved in the same L.A. –based artistic circle as the Eameses. For A Sample Lesson, Charles

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drew on these influences and his long-time amateur passion for photography to pioneer a fast-cut, three-screened photographic presentation used for cross comparisons and an experience saturated with detail and data.49

The Eameses promotion of film as enabling vision and constructing form is recorded in Charles treatise of vision some twenty years after A Sample Lesson in, “The Language of Vision: The Nuts and Bolts.” Stating that “universities are becoming discontinuity headquarters, with each department avoiding communication with others and the rest of the world”50, Charles advocated for visual departments. The idea for visual departments surely developed from his experience with multiscreen technology as a form of pedagogy, to fix the structural gaps of colleges and to better convey the importance of research.

In examining a lecture he gave later in 1953 at the School of Architecture at the University of California, Berkeley, using much of what he prepared for A Sample Lesson, one can better understand how Charles saw the interplay between vision, the practice of design, structure, and choice. The Dean of the School of Architecture, William Wurster, invited Charles to restructure the first year design course.51 Charles lectured the undergraduates on what was surely his underlying mission of his initial rough sketch: the importance of vision and his ambitious belief in design.

49 Ibid.


A transcript of the six-day lecture series features Charles arguing that an architect is no longer “merely a draftsman,” but a scientist, an engineer, a designer, a fine artist, and vice versa. In erasing the barriers between knowledge and vocation, Charles strove to prove that design was a universal, everyday activity. Design, as articulated in his definition of vision, is the process of seeing the subject from every angle, in all its aspects, through “intensive looking” which “helps to stimulate greater awareness” and “develop relationships.” Similar to A Sample Lesson, Charles demonstrated through his fast-cut slide shows, termed by him as ‘awareness shows,’ how inundation provokes entropy, breaking down the inherited order of pieces of data, and allows for “creative re-shuffling” and meaningful abstraction. It is this abstraction that the designer must commit to a series of decisions and constraints to create a structure that accurately solves the defined problem.52

By bombarding students with data and sensory stimuli, the team of designers hoped to model the experience of the information age. In creating an affective experience that induces students to retain rapidly appropriated information, students were required to employ the designer’s cognitive tools of ‘vision.’ ‘Vision’ is used to organize varied stimuli and to make sense of the world and its information as a means to solve problems. The subject of the course provides the various types of students—artists, future housewives, and even engineers— with many opportunities to explore “an awareness of relationships” and to understand “art as communication” integral in artistic and non-artistic vocations. The specialist is useless without the designer’s tools

52 Charles Eames, “Architecture 1 and 2,” Ark Annual (Student Chapter of the American Institute of Architects, College of Architecture, University of California, Berkeley, 1954), 29–31,
of vision and communication to impose a structure or order to educate the generalist consumer.\textsuperscript{53} Nelson wrote:

The modern way of seeing things starts with the assumption of a dynamic rather than a static situation, and it proceeds from this assumption to a growing understanding that relationships can take us closer to the truth about things than the things themselves. It also includes the idea that that path to truth can contain a number of contradictions. We were brought up to believe that if X is true, Y must, therefore, be false.\textsuperscript{54}

Education, in this sense of communication, is understood as “a process designed to impose a common order on a mass of events, an attempt to provide the individual with methods for coping with quantities of seemingly unrelated information.” In these terms, human behavior and decision-making reduce down to diagrammable reactions based on vision and pedagogy. Post-war theories of information processing and communication exemplified and extended the desire for algorithmic knowledge.

Characterized by “probabilistic descriptions of phenomena” for the “successful” explanation and management of the uncertain environment lay the groundwork for the formal language, tools, and ideology of technical control of systems discourse prominent in the 1950s and 60s. An ideology of control extended into business and


social domains, where actors and institutions sought control of social processes as if they were mechanical or electronic systems.55

The multiscreen technology and A Sample Lesson exposed a structuralist belief of vision, film, education, history making, and design. The incredible implications of revealing and manipulating the structures behind human behavior, deliver the designer the responsibility to “communicate truth as he perceives it.” Nelson in his lectures and writing reiterates that, “truth is the most important quality in design of any dimension.”56 George Nelson echoes Walter Benjamin’s fatalistic warnings about modernity, mechanical reproduction, and film when he argues that art is seemingly headed towards the “aestheticization of politics” as a means of control.57 It becomes apparent that as Nelson warned, “until we learn to comprehend it, we haven’t a chance of learning how to control it,” institutional actors such as the U.S. Government started thinking of midcentury design through a lens of control.58


Design Obsessed

To whom does design address itself: to the greatest number, to the specialist of an enlightened matter, to a privileged social class? Design addresses itself to the need.

-Charles Eames
Dear Ian McCallum: We have recently finished a 16-millimeter film which we call “A Communications Primer.” (It runs 22 minutes, is in color-sound.) A print has been at Edinburgh, and before shipping it back we have taken the liberty of sending it to you to view, if you are interested. (Mr. Nikolaus Pevsner saw some of the rough material when he was at Aspen.) “A Communications Primer” doesn’t pretend to “teach” anything about communications theory but is at best a door opener to some of the many aspects of this broad subject. We are now working on a sequel (not “Son of Communications” or “Communications Rides Again”—but “Theory of Feedback”). One of the reasons for our interest in the subject is our strong suspicion that the development and application of these related theories will be the greatest tool ever to have fallen into the hands of the architects or planners.59

Charles Eames to Ian McCallum, September 3rd, 1954

Charles Eames wrote to Ian McCallum, the Executive Editor of the British Magazine the Architectural Review, following the production of A Sample Lesson and A Communication Primer, optimistic of the results and the potential of communication as a tool of design. Ideological battles accelerated competition among the postwar powers of Soviet Russia and the United States. Intense competition led to the development of space technology, advanced nuclear bombs, digital computer systems, as well as communication theory and modern design. The United States,

along with the Eameses, increasingly employed communication theory, modernist design, and cultural diplomacy as diplomatic alternatives to nuclear cataclysm.

**Postwar Threats to World Order**

Growing concern towards the end of the Second World War and in the early years of the post-war world was centered on maintaining an even pace of economic development domestically and internationally. The abrupt transition from a wartime economy to a peacetime one was seen as precarious – many believed that this transition had the potential to push America back into the boom and bust cycle of the inter-war years, or send struggling nations into depression-like poverty on which totalitarian regimes and communist ideas could thrive. Western powers sought to foster global order, international peace, and economic stability through the establishment of international institutions such as the United Nations, International Monetary Fund, and the World Bank Group. Endowed with global sovereignty and immense capital, these international organizations were designed within a Western framework promoting Kantian, Keynesian, and American forms of Capitalist Democracy. Sated with Marxist critiques and resistant to secede its hegemonic power to an organization controlled by the West, the U.S.S.R refused to join.60

In 1946 George Kennan, a Foreign Service officer, was charged with understanding the Soviet’s reluctance to join the IMF and World Bank. Kennan responded with a five-thousand-word telegram regarding the postwar Soviet outlook,

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its background, projected policy on official and unofficial levels, and recommendations for US policy. In analyzing the postwar Soviet perspective, Kennan portended that the U.S.S.R will work towards “deepening and exploiting differences and conflicts between capitalist powers” in hopes of setting in motion the inevitable collapse of capitalism. He expected the Soviets to increase military and industrial activity to enhance Soviet power and prestige even through ruthless means. Forewarning, Kennan resolutely stated, “we have here a force committed fanatically to the belief that with the US there can be no permanent modus vivendi,” intimating that the Soviets understood the logic of force and would withdraw if they encountered a strong counterforce. Insistent, he urged the U.S. Government to take the lead in educating the American public as to the nature of the Soviet regime and in conveying a positive view of the future. Ultimately, Keenan’s telegram circulated in Washington and in Foreign Affairs magazine, proving persuasive in orienting politicians and the military-industrial complex towards a new ideological enemy.61 In 1947, President Truman presented to Congress the official policy regarding East-West relations in the form of the Truman Doctrine. His eponymous doctrine eschewed isolationism, instead embracing containment as the central policy and metaphor of the Cold War. Truman’s speech constructed a vision of the world as a closed, binary system: the United States or the U.S.S.R, democracy and capitalism or communism, freedom or slavery, good or evil.62

61 Ibid.
Order through Consumption, Identity, and Design

Stimulus and spoils of a large-scale war lifted the United States from economic austerity, firmly cementing America as an international hegemon and economic superpower. Domestic industrial production grew 15 percent annually, and 50 percent of the world’s goods were made by the United States. America held $\frac{3}{4}$ of the world’s invested capital and $\frac{2}{3}$ of the world’s gold reserve. Consequently, from 1947 to 1961 the national income increased by 60 percent and discretionary income doubled as the abundance of wealth transferred to American corporations and citizens. The American population increasingly pursued luxuries as the number of families rose 28 percent, and consumer spending increased 60 percent, with the amount spent on household furnishings and appliances increasing by 240 percent. Expenditures for education increased by 73 percent and for clothing by 53 percent, as compared with the more significant rise in spending for items previously defined as a luxury: for household operations a 108 percent increase, for recreation 185 percent, and for automobiles 205 percent. Enjoying a relatively distributed and stable economic boom, America’s sole threat to its supremacy was the ideological, political, and economic threats of left-leaning, Soviet Russia. A newly and intensely united government, industry, and citizenry endorsed the ideological binary and official policy of containment by projecting the superiority of a democratic, capitalist order, aligning

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64 Ibid.
65 Ibid.
consumption with freedom, and establishing a progressive and pleasurable post-war American identity.

  A rapid and focused reorientation towards a consumer economy pushed political, industrial, and cultural institutions to turn to modern design and the mid-century designer. The transfer from the Second World War to peacetime enabled inventive applications of new technologies, materials, and designs inspiring renewals of housing, furniture, and household item designs in an attempt to create and satisfy a constant demand for consumption, identity, and order.

  Space was created for economic production, scalable consumption, and social reproduction in the form of Levittown suburbs and regional shopping malls. Shopping malls proliferated at an incredible speed - in 1945 there were only three regional malls, but by the end of 1960, there were 3,840 malls. Spatial and social reorganization defined a phase of modernity, in which America was obsessed with design as a means of control. Part and parcel of this moment were the ascent of the Eameses, midcentury design, new materials like plastics, and surrealistically saccharine semiotics later employed in simulacra at the height of the American Century.

  As the war concluded, the Eameses rose to international fame, showcasing their designs in an exclusive, eponymous MOMA exhibition that resulted in their elevation to cultural icons. Curating showrooms and exhibitions for Herman Miller with George Nelson, the Eameses promoted “Good Design”, becoming icons and arbiters of a new, fashionable lifestyle in the postwar world. The 1950s were the height of Ray and

66 Ibid.
Charles’ production, designing everything from fiberglass, wire, plywood, and executive chairs to storage units, speakers, and furniture sets to masks, kites, and toys. Through showcases, television specials, and exhibitions, the Eameses captivated multiple generations of consumers who frequented the regional mall as a social activity and gathered around the television set every night.  

Figure 8: Early Postwar Ads Showing the Eames Chair as Cultural Capital

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In 1956, America tuned in on their television sets to watch Arlene Francis, host of NBC's "Home" show, introducing Charles and Ray to its audiences. Opening with the plywood Eames chair, Arlene Francis remarks that in the ten years since its release, the chair has caused an incredible excitement that has since then been followed by many more original Eames pieces. She states matter-of-factly to her loyal audiences that, “the designer, Charles Eames, has become almost a household word.”

The Eameses designs, like other midcentury designs, were ubiquitous as everyday objects, easily recognizable, and coveted forms of cultural capital. Through these objects, Ray and Charles came to define and develop a midcentury modern design with a particularly Californian and West Coast aesthetic—ostensibly free of politics, war, or destruction, and branded as optimistic, playful, cutting-edge, and glamorous.

Informed by progressive prewar theories of modern design, midcentury design was reconstituted in terms of “freedom of consumer choice and marketplace and the means to self-expression through the acquisition of goods.” Moral values, predicated on domesticity, corporate culture, consumption and democratic freedom and the elision of material objects with political and cultural philosophies, solidified an evocable and promotional post-war American identity. In the post-war world, designers were

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tasked with forging a new way of life for a generation of survivors, envisioning the post-war future, creating the phenomenology of the present, and reframing the elements of the past. The relative genius of a designer, at this time, was tied to how well their designs crafted the aesthetics of a modern lifestyle and perpetuated an American identity demanded by the consumer and institutional stakeholders.

The Eameses’ chair and their other designs were innovative, elegant, and affordable, eclipsing the high design and non-design worlds of post-war America. As a result, these progressive, portable symbols and their charismatic designers were assigned ambassadorial roles on behalf of the United States of America. As consumption and design became strategically aligned with democracy and freedom, the role of design became political. Consequently, the designer was recast as a diplomat, practicing cultural diplomacy through international exhibitions.

Exhibiting Ideology, Power, and Order

The “Exhibitionary Complex,” theorized by the Australian historian Tony Bennett, is helpful in understanding the significance of exhibitions as a practice of power and diplomacy, historically and during this time. Bennett examines how expositions, museums, stores, and zones of entertainment in nineteenth-century Europe and North America created masses of “a voluntary, self-regulating citizenry.” Projecting Foucault’s framework of power/knowledge onto exhibitions, displays, and fairs, Bennett argues that exhibitions are vehicles used to construct and amplify meanings to the objects on display, “inscribing and broadcasting” messages throughout society, acting as instruments of power and control. As a response to the
problem of order, the exhibitionary complex imposes order -- not through disciplinary apparatuses -- but by rendering “the forces and principles of order visible to the populace.”

Bringing together masses larger than ever assembled, exhibitions produce sets of relations through a network of institutions, directly and indirectly, constituting new, governable publics. 32 million people attended the Paris Exposition of 1889; 27.5 million went to Chicago's Columbian Exposition in 1893, and nearly 49 million to Chicago’s 1933-34 Century of Progress Exposition. With the rise of modernity, the state equipped itself with the ideological and political tool of exhibitions configured to serve “hegemonic strategies of different national bourgeoisies” as ‘places of pilgrimage’ to the ‘fetish Commodity,’ functioning less as a means for the working class to acquire technical education. Social and political forces seeking control rely on the design and influence of the exhibitions themselves in their ability to disseminate ideology in an expanding cultural sphere employing and articulating rhetorics of progress, nationalism, and imperialism.

Disruptive economic and political conflicts are transformed into quasi-technical or moral problems for social administration, and a problem of order becomes a problem of culture, in which it becomes “a question of winning hearts and minds as well as the disciplining and training of bodies.” This approach is termed ‘soft’ power, because institutions rely on voluntary participation rather than coercive force, and

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70 Tony Bennett. "The exhibitionary complex." *Culture/Power/History: A Reader in Contemporary Social Theory* 127 (1994).

71 Ibid.
works “by example rather than by pedagogy; by entertainment rather than by disciplined schooling; and by subtlety and encouragement.”\textsuperscript{72}

The postwar years featured an increase in government-sponsored exhibitions by both American and the Soviet Union. Cultural diplomacy took the form of the exhibitionary complex. Exhibitions, continually improved by designers, the state, and industry became a soft power alternative to nuclear or military brinksmanship. The Marshall Plan, issued a year before the Truman doctrine, not only injected economic stimulus into failing countries on the brink of communism, it also set the foundation for the practice and institutionalization of exhibition diplomacy. The Marshall plan detailed an Information Program in Europe, naming Alfred Friendly its director. While under Friendly’s administrative direction, the program established a film unit, a magazine unit, and an exhibition unit. In 1949 Roscoe Drummond replaced Friendly and later hired architect Peter Harnden who became chief of the Exhibits Unit and established the Exhibits department. In 1950-1951, close to a million and a half visitors saw the “Europe Builds” display as it toured seven European countries. In 1952, “The Caravan of Peace “ promoted the economic rather than military benefits of NATO. The Marshall Plan exhibits attempted to combat the influence of communism in war-torn Europe by promoting the benefits of modern capitalist societies, providing a model for future exhibitions of cultural and aesthetic diplomacy.\textsuperscript{73} In 1953, Eisenhower was inaugurated, Stalin died, Nikita Khrushchev rose to power, and the United States Information

\textsuperscript{72} Ibid.
\textsuperscript{73} Jack Masey and Conway Lloyd Morgan, Cold War Confrontation: US Exhibitions And Their Role In The Cultural Cold War, 1950-1980. (Switzerland: Lars Muller Publishers, 2008).
Agency (USIA) was created.\textsuperscript{74} This new information agency was responsible “to submit evidence to peoples of other nations by means of communication techniques that the objectives and policies of the United States are in harmony with and will advance their legitimate aspirations for freedom, progress, and peace [read capitalism].”\textsuperscript{75}

Countering the overt operations of the USIA, Russian participation in international trade fairs increased. To adequately compete with the quickening pace of cultural diplomacy, Eisenhower tapped into his Special Emergency Fund to create the Office of International Trade Fairs (OITF) within the Department of Commerce in 1954. Russia continued to close the gap regarding nuclear capabilities, intensifying Western concerns. Eisenhower’s call for the peaceful use of nuclear energy across the globe contended with Russian hegemonic ambitions for nuclear armament. As a result in 1955, New Delhi, India hosted an “Atoms For Peace” exhibition, where the most important players in the Cold War met and discussed the future as it relates to atomic development.\textsuperscript{76}

As an exhibits officer stationed in New Delhi, Jack Masey, future director of the USIA, became instrumental in installing the major exhibitions for the US Pavilion. Masey would escort international leaders, such as Prime Minister Nehru and Soviet Premier Khrushchev through the pavilion. Masey spearheaded the United States’

\textsuperscript{74} Wulf, Andrew. "MOSCOW'59 THE “SOKOLNIKI SUMMIT” REVISITED." (2010).


\textsuperscript{76} Ibid.
participation in exhibitions and fairs worldwide, and by the end of 1955, the United States participated in thirty-five exhibitions and fairs as compared to two exhibitions the decade before.\(^77\)

**A National Exhibit in Moscow**

On June 2nd, 1957, in a CBS “Face the Nation” interview, Khrushchev spoke to five million Americans watching at home, denouncing the iron curtain and appealing for a broader exchange of culture and trade. Four days after the interview, Soviet officials sent a formal proposal for an exchange of scientific, industrial, and artistic information for improved East-West relations. The diplomatic discussion finally ended on January 27th, 1958 with the signing of a cultural agreement. The Protocol Agreement signed on September 10th, 1958 outlined the agreement and provided “for the first time since 1917 a specific understanding through which national exhibitions would be exchanged between the two countries”. Authorized by Article XIII of the cultural agreement, the Soviets would stage an exhibition in New York during June and July of ’59, while an American national exhibition was confirmed for Moscow later in the summer.\(^78\)

Preparing for an American National Exhibition in Moscow, the USIA appointed Jack Masey the Chief of Design and Construction and commissioned George Nelson for the pavilion forthcoming in the summer of ’59. With only a $3.6 million budget and nine

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\(^77\) Andrew Wulf, ‘MOSCOW’59 THE “SOKOLNIKI SUMMIT” REVISITED.’ (2010).

months to complete the pavilion; Nelson was not optimistic, stating: “The stakes are high, the budget low, and the deadline impossible.” Almost immediately after the exhibition was approved, Masey called Buckminster Fuller, whose dome in Kabul two years prior had proved to be a successful display of American advances in design and technology. Not to mention, Fuller’s domes were practical, fabricated on delivery and installed onsite.79

Nelson, who had worked with Eames on A Sample Lesson and at Herman Miller, convinced Masey to bring Charles and Ray aboard. Masey, Nelson, Ray and Charles convened at the famous Eames House. The design team quickly came to a consensus regarding what would be included in the exhibition – a gold geodesic by Buckminster Fuller, a glass pavilion emphasizing American consumer products, and a multiscreen film by the Eameses. The pavilion was dubbed the 'Information Machine' since the team thought the ‘80,000 square feet of exhibition space was not enough to communicate more than a small fraction of what they wanted to say’.80

The pavilion would prove to be the site of one of the most important events in Cold War history, as Soviet Premier Khrushchev rhetorically battled with Vice President Nixon in the infamous Kitchen Room Debate. Testifying to the politics imbued within American consumer goods and domestic materials, Nixon walked Khrushchev through a staged model of an American home featuring the latest advancements in kitchen technology. While others lauded the progress of capitalism, Khrushchev protested,


80 Ibid,59.
arguing with Nixon about the inferiority of American design and the requirements of obsolescence within a capitalist, consumer economy. Politely rebutting, Nixon emphasized the improved quality of life for the average worker and his wife and family, and the need to adapt and renew antiquated parts and ways of life. Ideologically divided, both leaders engaged the each other in relative national advances, intensifying the competitive atmosphere indicative of the Cold War period. Sometime later in the day, Nixon and Khrushchev took their respective seats to watch the Eameses’ multiscreen presentation looming over their heads while debating in Splitnik’s kitchen.81

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The Development of the Multiscreen

The exchange of letters between Charles Eames and Henry Hart during the production of Glimpses of the U.S.A. and after the fair marks a dramatic shift in how Charles and the major stakeholders of the exhibit conceive the problem the multiscreen technology is employed to fix. 82 As examined in the last section, the multiscreen technique was first designed for A Sample Lesson and initially used for pedagogical purposes, relating to topics of art and communication, as a solution for educational discontinuity. However, in its second iteration, Charles and Ray view the primary problem as an issue of credibility between U.S. exhibitors and U.S.S.R. audiences. The second iteration, cut from a two-hour lecture to eleven minutes of film with seven screens, is thought of as a tool of credibility, persuasion, and control. The Eameses explained that using “seven screens over an area that was over half the length of a football field” was just a “desperate attempt to make a credible statement to a group of people in Moscow when words had almost ceased to have meaning.”83

In the development of the multiscreen technology as a tool of credibility, the Eameses decided to limit narration and instead relied on experiments on the number of images, their orientation, and time that would allow a viewer to be aware of them, but limit the audience’s ability to absorb or scrutinize them. Charles stated as much in an interview aiming “to have a credible number of images, but not so many that they


couldn’t be scanned in the time allotted. At the same time, the number of images had to be large enough so that people wouldn’t be exactly sure how many they had seen.” Charles likened the approach to the way people have been “universally trained” by credible, pictorial magazines like Life and Time to “thumb through double page spreads, scanning 6, 8, or 10 images at a time”. Ray explained the process of developing the second multiscreen show, recounting that “we tried all sorts of experiments, making it twelve [screens], nine, eight, and found that seven was handleable, but counted as "many." You couldn't go from one to the other in that short time of exposure; you could only sort of "sense" it, but by relating the subject.”

The multimedia experience was treated, as any Eames design was treated, from a chair to a museum exhibit, as a form of architecture and humanist structure. The Eames Office collaborated with the famous cybernetic filmmaker John Whitney Sr. Explained in his book, Digital Harmony, Whitney Sr., the chief editor of the film, believed that the filmmaker should produce a “liquid architecture” in which “structured motion begets emotion.” Applying cybernetic and psychological concepts to film theory, Whitney Sr. apprehended that visual and aural experiences were based on the relationship of differential, resonance, and harmony. Bringing this relationship to light,

84 “Industry Film Producers Association Speech by Charles Eames,” June 16, 1962, Private collection, Los Angeles.


Whitney and the Eameses devised a diagrammatic method for mapping the concerted dynamics of the performance (See Figure 10). Elmer Bernstein, matching the music to the imposed super-structure, described the Eamesian method:

Ray and Charles developed a charting system, which was visual….it was kind of like a ruler, you know, so many inches…for so many seconds and so on and so forth. And using various coloured pencils they started to make segments, a segment you know, and there’d be, a, lets say, it could be a red line over the entire segment indicating that this was so to speak, a piece. And if, within this piece, there were subplots, so to speak, a different coloured pencil would show you the subplots within the big segment.  

Figure 10 : Charles and Ray’s Algorithmic Film Structure For Glimpses of the U.S.A

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In this way the Eameses mapped their architectural methods onto their filmmaking, crafting a compelling narrative by paying attention to the emotional and psychological effects of the conscious human experience.

**Glimpses of the U.S.A**

Suspended within the geodesic dome was the Eameses’ second foray into multiscreen presentations, Glimpses of the U.S.A, projected onto seven 20-by-30 foot screens. The twelve-minute travelogue featured a montage of 2,000 still and motion images that told the story of two typical days in the life of the average American. Elmer Bernstein’s orchestral styling and Charles Eames’ brief narration accompany the visual sequence of everyday objects from cul-de-sacs, to backyard pools, commercial shopping centers, and automobiles making their way through traffic. Aerial views present objective evidence of the modern infrastructure erected for the new American way of life. A clip of Marilyn Monroe winking shows the seductive liberalism of American culture. Sentimentalism for the universal experience of nature, the land, the stars, and the city invokes a pathos that bridges the unrecognizable landscapes in which the Russian audiences are familiar. The famous denouement comes as a result of Ray. Wishing to diverge from its otherwise nationalistic form, Ray shot down Charles’ vision of the film ending with American fighter jets ripping into the blue sky, for a softer more heartfelt image of Nezabutki, the flower known in English as Forget-me-nots, a cross-cultural symbol of friendship. The Russian audience erupted in applause.
with tears streaming down their face. Having not seen the film until its debut in Moscow, Jack Masey described the multiscreen experience as a fellow audience member:

Soon the projectors were synchronized and the twelve-minute multi-screen film got under way. The combination of moving and still images, accompanied by a powerful musical score by Elmer Bernstein was fantastic! There were early morning scenes of children eating breakfast across America; aerial views of deserts, mountains and plains; cloverleaf highways jammed with automobiles; skyscrapers glistening at night; and the final closing scene; a bunch of Forget-me-nots- the universal symbol of friendship-depicted as a single image on the central screen. The Russians whispered “Nezabutki” (Forget-me-nots directly translated in Russian), and there were tears all around. When the film showing ended, there was silence. Everyone was mesmerized by the show. None of us had ever seen anything quite like it. Then the audience burst into wild applause.

The multiscreen presentation was wildly well-liked; it became the third most popular exhibit at the fair, drawing “5000 people into the dome, 16 times a day for the duration of the fair.” Charles on his return from Moscow boastingly writes in a letter to Henry Hart that Glimpses of the U.S.A. “set something of a record for the number of

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88 Ibid, 71-75.
people to view a film in a single house—2,250,000 in six weeks.” However, in the context of the national exhibit and the primary objectives of the USIA and the United States government, American officials recognized “it as one of the most successful acts of psychological warfare ever conducted.”

Figure 11: The Multiscreen Presentation of Glimpses of the U.S.A

Affective Reason in Cultural Diplomacy

The critical theorist Walter Benjamin predicted the use of film for political motives. In doing so, he imagined the experience of the modern condition was

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91 Bogart and Bogart, Cool Words, Cold War, 55.
mediated by ideological training in which film represented the ultimate technology to operate on the human sensorium:

Thus technology has subjected the human sensorium to a complex kind of training. There came a day when a new and urgent need for stimuli was met by the film. In a film, perception in the form of shocks [as an individual experiences while being jostled within a crowd or while acting as the receptor to mechanical affects when working on an assembly line] was established as a formal principle. That which determines the rhythm of production on a conveyor belt is the basis of the rhythm of reception in film.92

The producers and editor, namely the Eameses and Whitney Sr., relied on the montage and harmonic film structure and multiscreen technology to shock, jostle, ease, and produce the viewer. Disintegrated channels of communication between Soviets and Americans rendered linear forms of logic, reason, and pedagogy foregone. Charles and Ray felt that it was too optimistic and intensive for the time allotted in the movie by “[giving] credibility to it in a linear way.”93 Instead, they elevated visual and musical forms as parallel interfaces for communication with persuasive potentials. Untethered to the skepticism of language and primarily reliant on the filmmaker’s vision, the film induced a credible and compelling response through data inundation, appeals to motion and emotion, and in uniting a fractured vision into a coherent narrative predicated on a global, human identity. The first lines of the film state:

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Even on seven screens, twelve minutes is too short a time for one nation to tell its story to another. Some of the glimpses we offer will come and go too fast. Many others which we would like to show are completely missing. But we do hope that after these twelve minutes, you will feel that you know us a little better.94

By integrating common criticism of a biased kino-eye, the narrator makes the images and narratives that follow appear credible as if the images were chosen as an open set or the narratives written as an objective experience. However, the Eameses developed a form of algorithmic cinema as a tool of affective reason, hoping to produce a subject empathetic to the American experience by reproducing the “rhythm of production on a conveyor belt.”

The rhythms and cycles were not only effective; they revealed the pure mastery of the Eameses. Impressed Buckminster Fuller explained, “The thing was so moving in [the] orchestration of forms and colours and sounds that I thought it was incredible to me that anyone could have been master enough of those frames to make this whole thing really work together like orchestra instruments.”95

The orchestral elements or rather the synchronicity of these three variables were essential to the film, evidenced when the interviewer pressed Ray, “So synchronizing was terribly important?”, in which Ray responded, “Terribly important, and the relating of the subject matter was very important.” Ray recounted an anecdote of “a great

94 “Glimpses of the U.S.A.” narration, 1959, Eames Office, Venice, California; 12 minutes, 65mm.

experiment was when one went off, and it was chaos, it practically made them ill, you know, because you could handle it, with the relation of music and relationship of image and, if one was off in any way, they couldn’t take it.”

This mastery of images and rhythms appealed to the Aristotelian forms of ethos and pathos, laying the groundwork for the acceptance of a revised narrative of unity. Buckminster Fuller, reminiscing on the Eameses’ treatment of America, wrote that the film demonstrated the power of “the loving side of American life, that every one of the packed Russian audience could be seen at the end with eyes full of tears of [sic] the kinship of human beings.”

The visceral result of the film exposes how the multiscreen technique translates film into a sensible political imagination for a politically cloistered Soviet public vis-à-vis an affective performance. The organization of order/disorder and force/counterforce in the harmonic dynamics of the multiscreen presentation and the universalizing rhetoric of the Eameses’ narrative attempted to create a common human experience, a new global identity, and an indexical political order.

In this way, modernist design was employed in the new politics of the Cold War not only as symbolic objects but also through attempts at reconfiguring vision by invoking the exhibitionary complex and modern scientific theories of communication


and control. Design became praised by cyberneticist, filmmakers, modernist designers, and political official for its ability to manage complexities. However, George Nelson presciently understood the shortcomings motivating this optimistic approach to design as control:

The Bomb was programmed, designed, built, and exploded by people who presumably knew what they were doing. It is, I think, this new sense of intellectual mastery over the physical world that is making us so acutely and unhappily aware of the world over which seemingly we have no mastery at all.98

Ironically, the ideological battles between the U.S. and Communist regimes were only minor threats to American hegemonic order. Catalyzed by late capitalism, the Information age, and the Cold War race, the modernist vision had become widespread and single-minded pursuing algorithmic control.

Homogenous architectures and experiences of everyday America were increasingly untethered to reality and a growing desire for a pluralistic and democratic American identity. As a result tensions between regulating (modernist) and reactive (postmodernist) processes played out dramatically in the 1960s as new definitions of design, complexity, identity, and democracy were being imagined and realized.

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Digitally Imagined

If nothing else, a student must get from his training a feeling of security in change
-Charles Eames
PART ONE: IBM AND THE TECHNOCRACY

1. We have, in recent years, come upon some first rate planning tools—Theory of Games of Strategy Operations Research Linear Programming Many aspects of Information Theory (the computer or data processor I think of as something else—a piece of very valuable hardware, the development of which has made such theory workable) 2. Much of the nature of these tools would indicate that they belong to the mainstream of the architectural tradition. 3. We can be reasonably sure that these, or similar tools, will be used to attack some of the architectural problems already upon us. 4. We can hope that the architect will be the one to use these tools. – Charles Eames, June 1, 1960

Charles Eames wrote to Reyner Banham, a leading architectural critic and author of Theory and Design in the First Machine Age, debating the relationship architects should have with science and technology. In his letter, Charles alluded to Two Cultures, the British scientist and novelist C. P. Snow’s incredibly influential thesis written just a year earlier. Like Snow, Charles and Ray Eames had long viewed that the intellectual life of western society had been split into the two cultures of sciences and humanities. The rapid polarization and widening division has induced unknowable practical, creative, and intellectual losses that have hindered the greatest minds to solving the world’s problems. Charles and Ray sought to merge the scientific and the artistic by erasing the boundaries between two, redefining the role of


the designer. As a defying force, Charles and Ray saw their practice of design not only in a divided culture, but also in a rapidly interconnected twentieth century, gifting new disciplines with each other’s tools. As practitioners, the Eameses brought together these two cultures, unlike ever before, through their work promoting IBM’s technology, helping build an all-encompassing technocracy. From Herman Hollerith’s punch card to early tabulators and analytic analyzers to the advent of the electronic computer, IBM was the world’s leading producer of business machines and the paragon of American capitalism. By the 1940s, Thomas Watson Sr., CEO of IBM, led the company to a near-monopoly of the U.S. punch-card market with over 90 percent of the market share proving that it was not the era of nuclear energy, but rather the Information Age.101 IBM’s postwar reach was seemingly total:

IBM first came into your life when your birth was recorded on a punched card. From then on many such cards have been compiled, giving a lifetime of history of your important decisions and actions. If you went to school, entered a hospital, bought a house, paid income tax, got married or purchased an automobile, the chances are that permanent punch records were made of these and other personal stories.102

In the 1950s total military expenditure reached 20 times its prewar level, while military R&D surpassed, its World War II high. The United States government invested


as much as $14.6 billion by 1961 for research and development. As a prominent member of the military-industrial complex, IBM consistently developed new technologies for filing, sorting, and analyzing data. Additionally, IBM’s rapid postwar success was aided in large part by modern laws requiring data gathering and tabulation by government and industry. Cold War pressures, increased corporate demand for data management systems, and large investments in R & D by the U.S. and industry leaders, advanced computer research, equipment, and software.

Assuming the bulk of R&D funding from U.S. military agencies, IBM adopted a strategy of heavy investment in research, and in turn reinvesting over 50 percent of its profits in internal R&D. Over the next two decades of the information age, IBM


emerged as the dominant company in the world computer market. During the transition from the punch card to the electronic computer, IBM also changed its antiquated model of business practiced as corporate nationalism, and patriarchal leadership by Watson Sr. to a more modern version of a multinational corporation led by Watson Sr.’s son, Thomas Watson Jr.

The younger Watson inherited a company built from the ground up by his father. There was an immense pressure put on Watson Jr. to continue IBM’s success. Instead of being a steward of his father’s legacy, Watson Jr. felt the desire to make his mark on what many believed still to be his father’s company, or so he writes in his autobiography:

Still, I needed something that would signal that I was running IBM now and that times had changed. We were a computer company, not a punch card company; we were firmly in the 1950s, not the 1920s; we were leaders in a new field that would shape the future. I decided I could put my stamp on IBM through modern design.105

Thomas Watson Jr. supplanted his father’s legacy by becoming known for his famous adage “Good Design is Good Business.” In becoming the greatest American capitalist, Watson Jr. increased IBM’s gross revenue from US$892 million to over US$8 billion.106 As CEO, Thomas Watson Jr. created IBM’s Design Department, which aided


the company through fundamental shifts in structure, orientation, and image and contributed to the company’s incredible success.

Thomas J. Watson, Jr. was introduced to Eliot Noyes, former director of the Department of Industrial Design at the Museum of Modern Art, during their shared time as piloted gliders in the air force during World War II. In 1947 IBM employed Noyes to design a model A typewriter. In 1954 Watson contracted Noyes to create an IBM display facility in New York City to compete with the more modern and flashy Olivetti display on Fifth Avenue. In 1956, as a measure to compete with Olivetti, Watson created a new Design Department for IBM, the earliest US "house style" program of its kind, and hired Noyes in 1956 as the consultant director, tasked with improving the visual quality of IBM’s products. The Design Department would go on to promote IBM’s image, educate its consumers, and improve their management, business, products, and in many ways create the paradigm of the modern multinational corporation. From his experience at the MoMa, Noyes knew and procured the leading talents and most modern artists of graphics, architecture, and design, notably, Paul Rand, Marcel Breuer, Mies van der Rohe, Isamu Noguchi, Eero Saarinen, and of course, Charles and Ray Eames.  

Over the next twenty years, the IBM Design Department, through its contributions of architecture, sculpture, photography, film and graphic design, redefined the relationship between business and design. Corporate design, culture,

and technology intersected to not only form a consistency of look and feel, but intentionally re-imagine the “business organization itself—its management, operations and culture, as well as its products and marketing—as a work of art.” 108

IBM, Noyes, and the Eameses, et. al recast the role of the designer as a technocrat and “curator of corporate character ”, as Noyes explains:

> It does seem to be a part of the role of the designer to help identify this character, and then express it in terms of the most meaningful goals and the highest ideas of the company and in the broadest context of our society and economy.109

Before Watson Jr. and the use of modern design every company room was adorned with the founder’s paternalistic figure and followed a completely centralized management in which, “getting things done consisted mostly of wisdom carried in a few people’s heads.” A Watson Jr. believed “IBM was too big for [Watson Sr.’s approach] to be practical.” A digital and design revolution followed with the transition of power, consequently Watson Jr. replaced his father’s image with Paul Rand’s new corporate logo and assigned a new director of organization to restructure the corporation into highly specialized departments. The organizational complex, of which the design department headed, pushed IBM into the digitally imagined phase of modernity, managing through decentralization and dematerialization.


109 Ibid.
The Eameses at IBM

At his initial summit with Eliot Noyes and Paul Rand in the Poconos at Buck Hills Falls, Watson Jr. was introduced to the role design could play in IBM’s future and the future of corporations not only through Rand’s report, but by a reel of film Eliot Noyes brought with him. The film was Charles and Ray Eames’s A Communication Primer. The film demonstrated to Watson Jr., a sentiment that he would later remark about the Eameses, that “Charlie can put what a computer does into a little cartoon-like film and in the course of twelve minutes have everybody in the room understanding—how they work.” As a part of the Design Department, the Eameses and IBM would enjoy a thirty-year partnership that resulted in dozens of projects, films, books, exhibitions, multimedia presentations, and world fair ephemera.

The Eames’s experimental approach and pioneering use of innovative technologies, as shown in at the 1959 American National Exhibition in Moscow, paired exceedingly well with IBM, as they partnered in educating publics not only about technology, or IBM, but also the new American identity in relation to man’s history. In fact this was further illustrated when the Eameses’ film Glimpses of the U.S.A presented Russian viewers scenes of a foreign America, naturally provoking inquiry in America, only to have those questions answered as they left the pavilion via a computer-programmed RAMAC machine in an IBM-sponsored display.


Soviet Audiences asked questions and the IBM computer answered them like this:

Q. What is the price of American cigarettes?
A. It varies from 20 to 30 cents. The average semiskilled worker earns enough money in one hour to buy about eight packages.

Q. What is meant by the American dream?
A. That all men shall be free to seek a better life, with free worship, thought, assembly, expression of belief and universal suffrage and education.

Q. How many Negroes have been lynched in the United States since 1950?
A. Seven deaths—six Negroes and one white—have been classified as lynchings since 1950 by the Tuskegee Institute, a Negro college. Responsible Americans condemn lynching and the perpetrators are prosecuted.

Q. What is the average income of the American family?
A. $6,100 in 1957.\(^{112}\)

\(^{112}\) Wulf, Andrew. "MOSCOW '59 THE "SOKOLNIKI SUMMIT" REVISITED." (2010).
For the IBM Pavilion at the 1958 World's Fair in Belgium, Noyes and Watson Jr. commissioned the Eameses to produce the film, *The Information Machine: Creative Man and the Data Processor*. Hand drawn in an old-fashion cartoon style, the film introduce and educated audiences on the electronic computer, by presenting the electronic computer as an extension of man's centuries-old practice of controlling his environment and expanding his intuition by processing information through the development of tools and systems.\(^{113}\) The historical place of the designer and their relationship to the future and technology are heroically represented in the following scene:

Since the time when man began to control the environment, he has been plagued by his limited ability to speculate: His failure to accurately predict the effect of a proposed action. This is the result of his not being able to consider and relate all the factors in a problem. Evidence of this inability can be seen in the persistence of a certain kind of myth involving three wishes. In a frantic effort to reap immediate reward, the first wish is often not too wise. The second usually tends to over-correct. Our hero can consider himself lucky if after the last wish he ends up just where he started. But there were men whose wishes were not only prudent, but

had a habit of coming true. These man-and women-were artists and had certain characteristics in common.\textsuperscript{114}

The script of The Information Machine corroborates Noyes’s sentiment expressed during an interview, “If you get to the very heart of the matter, what IBM really does is to help man extend his control over his environment….I think that's the meaning of the company”.\textsuperscript{115} Complementing this approach, the Eameses and IBM “believed that if you educate society, you not only do a positive good, you also create a group of people who are better able to appreciate the work and products of IBM.”

Immediately after the exhibition in Moscow, the Eames Office produced a sequel to A Communication Primer for IBM. The 1960 film, An Introduction to Feedback, is one of just a series of films, like Think, that to emphasize man’s pursuit of control and explain the principles underlying the operation of modern digital computers. \textsuperscript{116} Presciently the film starts with the narration:

Plotting a course is one thing, holding a course is quite another. The control of situations through guiding and steering is among man’s greatest accomplishments, and yet remains his greatest problem.\textsuperscript{117}

\begin{itemize}
As the digital computer and man’s search for control become more prolific in the 1960s, IBM, its Design Department, and modernist design become more and more central to renegotiations of the past and the future in America. During the 1960s IBM would partake in what is now known as the $5 Billion Dollar Gamble --the largest privately financed initiative in the history of capitalism—as an uncertain means to modernize and maintain its dominance in the world of computers and the technocratic dominance in the society of man. The initiative hedged the mammoth company, and possibly the future of America on its departure from an orthodox vision of industrial, technological, and corporate control towards a more decentralized expansion and expression by launching the development of its System/360 line of computers as integrated systems. IBM announced its System/360 just before the 1964-65 World’s Fair opening—an opportunity they believed was too important to forgo.  

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PART TWO: The 1964-65 New York World’s Fair

Prematurely promoted as the “greatest single event in history” the 1964-65 New York World’s Fair sought to bring the nations of the world together under the banner of “Peace Through Understanding”. Going beyond playful hyperbole, the dedication of the fair to "Man's Achievement on a Shrinking Globe in an Expanding Universe" echoed a feeling of technological determinism in uniting American citizens as well as the nations of the world together under a global order and universal human identity.  

Presented as the last, great utopian promise of modernist America, the Fair was positioned within and between movements of modernity and postmodernity, as America was in the midst of the Cold War, civil rights protests, emerging feminist and environmental movements, decolonization, and the escalation of the Vietnam War. Conceived as Robert Moses’ modernist dream, the Fair would inevitably lead to his tragic downfall. The rise, controversy, and fall of Robert Moses’ Promethean figure perfectly mirror the rise, tension, and subversion/inversion of modernist design and obsessive visions of control. The Fair’s controversy and design, for purposes of this project, aids in understanding the mounting conflict between the modern and postmodern, the context of the Eameses’ IBM Pavilion, and its legacy in the second half of the American Century.

The man originally behind the concept of the fair was a poetry-loving idealist and successful Real Estate Business man, Robert Kopple. During a discussion at dinner with his family in 1958, Kopple realized his daughters’ worldviews were

completely in terms of black and white, and worse, terribly devoid of optimism for the future. Recalling his childhood memories of the 1939-40 World’s Fair and the promises of a new, progressive future, Kopple recognized that a new generation of post-war families needed exposure to optimism and diversity if peace was ever going to prevail over hatred during the American Century. Almost immediately, Kopple met with Robert Wagner, the mayor of New York City and offered the idea of a second world’s fair as a way to celebrate the city’s tri-centennial. In October of 1959, Governor Nelson A. Rockefeller, Mayor Wagner, and then City Parks Commissioner Robert Moses traveled to Washington to secure the support of President Eisenhower. After beating out other major American cities like Los Angeles and Washington, D.C. for hosting the fair, Robert Moses successfully led a coup to oust Kopple as President of the World’s Fair project. Moses stated his disdain for the idealist, “These fellows that started [the Fair] had to get out, so I could have a free hand. They were not the kind of people I would hire. They had to go, and they were paid.” Disgruntled, Kopple likened the great planner of New York to a dictator, “He simply can’t tolerate independent strength in anything he runs.”


The Power Broker and His Dream of the Fair

Moses, known infamously as ‘The Power Broker, intended to use the fair to accelerate his infrastructure expansion and to complete his ultimate dream of building the world’s finest park in Flushing Meadows. Once a beautiful marshland, Flushing Meadows had succumbed to intolerable and endless waste of a growing urbanity by the 1920s. Inspired by the modernist urban planning movement, particularly Baron Haussman’s renewal of Paris and Le Corbusier’s theory of urbanism articulated in Radiant City, Moses became dedicated to the urban development of New York City. Coming to power in the 1930s as part of Mayor La Guardia’s adoption of Roosevelt’s New Deal, Moses worked tirelessly to improve the city’s infrastructure. The Master Builder’s power was consolidated under the title of New York City Parks Commissioner—in fact at his height Moses simultaneously held twelve major political titles without being elected to any public office. In his 50 years in office, Moses built 700 city parks, seven major bridges, practically all of the city’s expressways and parkways, and dozens of public housing projects. As New York City—following World War II—became synonymous with crime and congestion, and white-Americans, subsidized by the G.I. Bill, fled urbanity for the suburbs, Moses led relentless efforts in revitalizing the city by clearing slums, tearing down historic neighborhoods, and pushing out marginalized tenants in favor of highways and mega structures, beaches, and parks. The famous architectural historian Lewis Mumford once said, “in the twentieth century, the influence of Robert Moses on the cities of America was greater than that of any other person.” “The Power Broker” was more than used to having influence and getting his way, exerting his vision and will, making him the perfect archetype for demonstrating
how modernist design was used as a form of control. “Everything he saw walking around the city made him think of some way that it could be better,” and Moses never stopped imagining Flushing Meadows Park as his grandest scheme for transforming it into would be the ultimate modernist dream and the greatest demonstration of his mastery. Moses envisioned a “Versailles” style park comprising 1300 acres of land at the very geographical center of the city. Initially, Moses sought to realize this dream when New York City hosted the 1939-1940 World’s Fair. The conveniently high budget and high priority allowed Moses to personally oversee the conversion of the “valley of ashes” to the fairgrounds for “the world of tomorrow.” However, despite commercial success, the 1939 fair ended in financial failure, leaving Moses without the funds to clear the trash and pavilions of the fair, let alone complete the work on his grand park project.  

As soon as the business and political elite accepted Robert Kopple’s idea of a second World’s Fair to New York City, Moses began scheming to use the 1964-1965 Fair as a vehicle to complete Flushing Meadows Park. Moses offered the nostalgic fairgrounds for a ridiculous sum of only one dollar per year, and as soon as the city accepted Moses’ fate –along with the fate of modernist design – became tied to the 1964-65 World’s Fair.

From the moment Robert Moses resigned his position as Parks Commissioner and was sworn in as the President of the Fair, he fought for sole control. Disobeying the sanctions of the Bureau International of Exhibitions (BIE) the ruling body that sanctioned World’s Fairs, Moses determined the fair would have to run for two years to

\[122 \text{ Ibid.}\]
be profitable, while BIE rules stated that an exhibition may only run for a six-month period. Furthermore, Moses decided to charge rent to exhibitors, which was also a violation of BIE rules. Not to mention, Seattle was already chosen to host an exposition in 1962, and no country was allowed to host an international exhibition within ten years of its last exhibition. As a result, the BIE decided to boycott the fair and America’s closest allies, such as Britain, France, and Italy, followed the bureau’s decision leaving fewer than twenty-three countries represented, as corporate America tried to fill the large absence of the international community with twenty-eight pavilions of its own. Unperturbed, Moses pushed on, as the fair didn’t mean the same thing to Moses as it meant to Kopple. The Fair, to Moses, wasn’t about peace, or the diversity of the nations of the world, it was merely a disguise for a massive renovation of infrastructure, which included a new expressway and a major league stadium. The cost of the fair was as large as the personality of its new president, totaling an astounding $1 Billion dollars. The future Moses envisioned was one of commercial boosterism, international contention, domestic protest and controversy, and ultimately the rise of a nascent Postmodernity.

America’s Postmodern Reaction

Truman and Eisenhower’s black and white world gave way to John F. Kennedy’s New Frontier. Kennedy’s picture of America as Camelot abruptly ended with his assassination, puncturing the utopian vision of America and its pursuits. The New

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Frontier, perpetually pushing to new domains, transitioned to a state of interrogation. The moral, philosophical, political, economic, social, and cultural inquiries, led by a reactive body of a traditionally marginalized and oppressed populace, resisted traditional forms of control and leveraged their control, primarily through progressive advocacy and participatory democracy.

In the early 60s, Jane Jacobs famously defended New Yorkers from the threats of orthodox modernists like Robert Moses in *The Death and Life of Great American Cities* published in 1961. Jacobs viewed neighborhoods as complex organisms giving life to the city – not as slums. \(^{124}\) Rachel Carson released her expose’, *Silent Spring*, in 1962 giving way to the modern environmental movement. In 1963, Betty Friedan penned her personal experience as an unfulfilled modern American woman in *The Feminine Mystique*. Continuing to fight racial injustice the Civil Rights movement saw victories in July 1964 with the Civil Rights Act and in August 1965 with the Voting Rights Act. From ideas developed during the 50s and 60s, Robert Venturi published his first book, *Complexity and Contradiction in Architecture* (1966), opposing orthodox opinions and practices of modern architecture and design, introducing a new alternative to the failings of modernism from which postmodern architecture would emerge.

*Complexity and Contradiction in Architecture*, is regarded as one of the most important writings on making architecture since Le Corbusier’s *Towards a New Architecture* written in 1923. At all scales, complex and contradictory architecture

separates itself from the purism demanded by early modernists, exemplified through Mies van der Rohe’s iconic adage, “Less is more” by rebutting, “More is not less. Less is a bore”. In moving past the simplistic principle of “accommodation” in organic design, Venturi responds to the contemporary, seen in the formal impoverishment and cataclysmic trajectory of urban renewal, by replying with a theoretical, phenomenological, and physical urban experience of complexity.\textsuperscript{125}

Venturi’s preface to his architectural contribution explains his approach to architecture and design and links him intimately to the Eamesian approach. Essential to architecture, writes Venturi, is the process of comparison and analysis to break things down to their elemental and basic parts as a means for later integration. To Venturi, “self-consciousness” is a fundamental mode of experience for criticism and creation. In the body of his text, Venturi questions the practices of “platitudinous architects who invoke integrity, technology, or electronic programming as ends in architecture”, admonishing their roles as “popularizers who paint ‘fairy stories over our chaotic reality’ to suppress those complexities and contradictions inherent in art and experience.”\textsuperscript{126} Instead, Venturi prepared a “gentle manifesto” listing his values, in which he prefers the vitality in messiness and the validity in compacted expressions:

\begin{quote}
I like elements which are hybrid rather than ‘pure,”
compromising rather than “clean,” distorted rather than
\end{quote}


\textsuperscript{126} Ibid, 12-14.
“straightforward,” ambiguous rather than “articulated,” perverse as well as impersonal, boring as well as “interesting,” conventional rather than “designed,” accommodating rather than excluding, redundant rather than simple, vestigial as well as innovating, inconsistent and equivocal rather than direct and clear.

I am for messy vitality over obvious unity.
I include the nonsequitur and proclaim the duality.
I am for richness of meaning rather than clarity of meaning; for the implicit function as well as the explicit function. I prefer “both-and to “either-or,” black and white, and sometimes gray, to black or white. A valid architecture evokes many levels of meaning and combinations of focus: its space and its elements become readable and workable in several ways at once. 127

The subtle shift from a Boolean, either/or, to a triadic, both/and, expression of logic, opens space for pluralist imaginings of objective realities. The postmodernism impulse is not simply seen as antithetical to modernism, and therefore entirely

reactionary, but also synthetic to modernism, as a form of equilibrium. Venturi quotes August Heckscher:

The movement from a view of life as essentially simple and orderly to a view of life as complex and ironic is what every individual passes through in becoming mature. But certain epochs encourage this development; in them, the paradoxical or dramatic outlook colors the whole intellectual scene. . . . Amid simplicity and order rationalism is born, but rationalism proves inadequate in any period of upheaval. Then equilibrium must be created out of opposites. Such inner peace as men gain must represent a tension among contradictions and uncertainties. . . . A feeling for paradox allows seemingly dissimilar things to exist side by side, their very incongruity suggesting a kind of truth. 128

Progressivism fought with a complementary force of oppression, as leaders and factions of complementary movements engaged in public discourse and sometimes militant contentions, all the while President Johnson began escalating the war in Vietnam, sending ground troops and daily bombing raids over the Communist-controlled North Vietnam territory. 129

128 Ibid, 102.
A popular and highly visible locus for this discourse and demonstration was, of course, Moses’ Fair. The fair opened on April 22nd, 1964 for two six-month seasons concluding on October 21, 1965. Welcoming over 51 million visitors becoming the highest attended World’s Fair in history at the time, despite the BIE’s sanction and lower than anticipated – by 26 million- ticket sales and attendance. The 1964-65 World’s Fair would become preserved in the memories of east coast baby-boomers, enacted time and time again as a common cultural touchstone – of which the Eameses IBM’s Pavilion was arguably the most remembered. However, ignorant to the changing winds of the American Century, Moses closely controlled the way life was depicted inside the fair, and instead of imagining a future, Moses anchored his fair in the nostalgia of a stable past. As a result, the Fair came under incredible criticism and investigation.\textsuperscript{130} Unimpressed, \textit{Time} Magazine described the Fair, not as the “World of

Tomorrow”, but rather as “The World of Already”. Moses refused to employ African-Americans in anything other than menial roles in the fair, drawing the ire of Civil Rights demonstrators. As soon as the Fair opened, protestors and demonstrators for a bevy of causes and political movements blocked traffic on the new expressway and entrances to the Fair. The Fair was designed to fashion new desires for commodities, namely computers, cars, and household items; not confront the tenuous problems of social relations in the 1960s, however, it became painfully aware that in order to sell the material conditions of the present, one would have to confront the social conditions of the present.

Figure 15: A Layered, Postmodern Landscape of the New York World's Fair


Charles Eames later claimed in a speech to a conference of graphic designers that the separation and disintegration of communication, observed outside and inside the fair, could be seen in the experience and materials of the Fair. Charles noted, “there was almost no relation between those involved with the nation’s products, countries, or enterprise and the front that they were putting on at the fair” allowing for the line of communication to be drawn so thin that it was practically nonexistent.

Consequently, pavilions exhibited a “preoccupation with certain symbols of culture; certain aspects of this that really mean the state of culture of the country is completely good”. Despite Charles’ involvement in advancing modern advertising for corporation, he admonished its crude practice “to impress a public about the goodness of an abstract company, in a way through motherhood or something, which had nothing to do with the product or the inference or the significance of the product or the enterprise itself.” This lesson of communication is even more sobering and important when it’s understood “vis-à-vis the social structure of the country today”. Eames promoted the postmodern sentiment that ideas and communication were degenerating so rapidly, while advancements in industry and social identities were become more and more complex. The result, Eames claimed, was that corporations and affected communities were at a loss as they “out reach or out-step... the symbolism that we had evolved to talk about it” to the point that “we have no way to talk about it”. To Charles this semiotic dissonance had real societal implications, and was the first step towards the United States of Amnesia:

\[133 \text{ Ibid.}\]
The point is that the thing is very real to us in the United States, that the symbols of culture sort of get this attention in the name of culture while these real things which make the culture, the quality of the soup that you get in the restaurant or bread or what you walk on underfoot, or those thousands of things that really stand for the true measure of the culture are being neglected.”134

Charles recounted a late-night television interview of the television personality Alexander King evidencing the disintegration of communication and how it was metastasizing from the cultural sphere to political and personal dimensions of American life. Charles related King’s interview:

By this time he was facing the audience, and he was saying, “Before I leave I want to say something directly to the audience.” So he got the camera in and said, “You out there in the big audience, I want to warn you about one thing, I want you to be prepared, for someday, sometime, somebody is going to knock at your door and,” he said, “they are going to bring up a subject which is terribly important to you and to your community. What they are going to do is in some way lead into the subject— a very vital one— the organization, the building, the creation of a cultural center in your town. Now is the time for you to really act. Stand up and be proud, and when they ask for your participation say no, absolutely no. Have nothing to do with it.”135

134 Ibid.
135 Ibid.
The prioritization of wealthy corporations using the Fair as a vehicle for marketing led to an overall lack of unity and the disruption of lines of communication among fairgoers, corporations, participating nations, and designers. Vincent Scully, the same architectural critic that lauded Robert Venturi in the introduction of Complexity and Contradiction in Architecture, wrote an article titled, *If This Is Architecture, God Help Us*, lambasting the fair for its lack of architectural unity, gaudy ornamentation, kitschy aesthetics. Unanimously criticized, the fair’s architecture was seen as "the most horrendous hodgepodge of jukebox architecture." The New York Times critic, Ada Louise Huxtable, thought the fair was “disconnected, grotesque, lacking in any unity of concept or style.”

The fairs' hodge-podge of designs was mainly the result of Moses' disdain for the original design proposal of a gigantic doughnut-shaped pavilion with different exhibitors renting "slices." Not only was this a tired concept borrowed from the 1867 Universal Exposition in Paris, but Moses insisted:

> Such a single giant doughnut would have discouraged all freedom, originality, experiment, color and boldness in form and design, precisely the qualities which my avant-garde associates in the architectural field and their friends, the critics, always insist must be given free rein in expositions which will determine the pattern of the future.

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137 Ibid, 339.
The uncharacteristic insistence of Moses for "freedom, originality, and color," showed how flexible "The Power Broker" could be for corporate interests investing capital into the fair and his park. While Moses was deciding whether to use the unified doughnut design or the laissez-faire and architecturally diverse approach, IBM contracted the Eameses to consult about entering the fair. Initially, Eames believed the doughnut design made "an awful lot of sense, and had it gone through we would have recommended that IBM go in." Instead, as the laissez-faire method won out, the Eameses advised IBM to forgo the fair, but in a twist of fate IBM determined “they had to.” In the fall of 1960, IBM assembled a committee of Noyes, Rand, the Eameses, and some IBM engineers and managers to select an architect for the World’s Fair Pavilion. Considering Walt Disney and Buckminster Fuller to design the exhibit, IBM eventually decided on Eero Saarinen and Charles and Ray Eames.

The IBM Pavilion

The Eames Office and Saarinen started discussing concepts in 1961 and began working on the project in 1962. The Eames Office was responsible for the exhibition, material, film presentations, graphics, and pavilion signage, while Kevin Roche and John Dinkeloo completed Saarinen’s work after Saarinen’s death in 1961. Charles and Eero agreed to make the pavilion “unarchitectural.” The “unarchitectural” effect was designed to induce the visitor to not remember the architecture but the experience.

The pair of designers imagined an amusing experience on par with that of a carnival or

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the Tivoli Gardens. To accomplish this, the designers blended natural and industrial forms. Charles stated, “From any approach, the visitor looks through trees and shrubs into an open and spacious structure. The supporting elements are so developed that they are not unlike the natural forms themselves.” A grove of 45 “trees”, constructed of steel with translucent and color plastic roofs, covered an area of 38,000 square feet.

The pavilion area was divided into six sections housing several exhibition performances according to an IBM Press Release. The Pentagon Theatre supported animatronic puppets used to explain how data processing systems work. Mechanical puppets cast as Sherlock Holmes and Dr. Watson demonstrate the usefulness of basic “yes-no,” Boolean logic, used by computers to solve problems. Two other sections were dedicated to administration and the Scholar’s Walk, which an exhibit of collected graphics assembled during research for the pavilion and illustrates the history and

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140 Ibid, 1-3.
development of modern computer technology. The “Probability Machine” occupied another section under the canopy, demonstrating the applicability of probability theory to the real, physical world. Additionally, there was a Computer Applications area dedicated to IBM’s newest data processing systems demonstrated various forms of information retrieval, creating new interfaces between the human and digital world. Capturing the spirit of a “Digitally Imagined” phase of modernity, IBM displayed its new optical scanning technology. The performance demonstrating the Optical Scanning and Information Retrieval machine asked visitors to handwrite any date on a card. Upon feeding the note into the data processing system, a tiny electronic scanning beam outlined the contours of each number by traveling around the marks in a series of continuous circles, tracing and identifying a specific numeral. The optical data was then transmitted to another computer to retrieve a headline from The New York Times associated with the written date. In a display foreshadowing the processing and retrieval capabilities of Google, IBM showcased the past and the future, now mediated by the digital computer. 141

**The Ovoid Theater**

The marquee attraction of the IBM Pavilion was the aptly titled, “Information Machine”: a 90-foot-ovoid theatre on the northwest edge of the Pool of Industry (See Figure). The ovoid theatre housed *Think*, the Eameses’ newest and most immersive iteration of their multiscreen performance.

Built in the mimetic tradition adopted by Postmodern architecture, the ovoid theatre resembled IBM’s selectric I typeball mechanism. Designed by Eliot Noyes, the Selectric typewriter was introduced on July 23, 1961 with a unique "golf ball" mechanism instead of a traditional type bar (See Figure 18).
The new design did away with individual typebars that were prone to jamming when striking in rapid succession, in favor of a spherical type element that rotated and pivoted to the correct place before striking, making the typewriter incredibly efficient. IBM’s selectrics eventually captured 75 percent of the United States market for electric typewriters used in business.  

Adorning IBM’s symbolic element of innovation was Paul Rand’s new corporate logo embossed 3,000 times around the circumference of the ovoid. The new logo, in its singual and subliminally redundant, image not only identified the company, but signified the company’s abstract technological heroism.

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The “golf ball” structure mimics what Robert Venturi and Denise Scott Brown would later term, in their Postmodernist manifesto, Learning From Las Vegas, a "Duck." The term derives from an actual duck-shaped building in Long Island, New York called, "the Big Duck (See Figure 19)." The building was built as a store for selling ducks and duck eggs, thus explicitly telling motorists and passerby’s what they will find inside. This indexical semiotic relationship between the form and function of the building is a demonstration of aesthetics being driven by consumerism, "where the architectural systems of space, structure, and program are submerged and distorted by an overall symbolic form."  

Figure 19: The Duck Store and Venturi's Duck

However, to fairgoers, journalists, architectural critics, and IBM employees, the white ovoid theatre not only resembled IBM’s “typeball” mechanism, it also resembled an egg (See Figure 20). The “IBM’s World’s Fair ‘Egg’” sat on a nest, formed by a grove of man-made steel trees, a rusted forest of 32-foot-high, tree-shaped supports that elevated the ovoid theatre and provided a canopy for the exhibits below.

![Figure 20: An Advertisement For IBM’s World's Fair Egg](image)

From a distance the fairgoer is invited to speculate the embryonic development of what’s inside. It is not until the fairgoers takes a seat on the “People Wall” and are lifted into the egg, becoming both a spectator and a participant of the spectacle, that light enters, the spectator is prompted to Think, the virtual display begins, and the Postmodern world emerges as it hatches from Eameses’ egg into Venturi’s “Duck”. Kevin Roche, the architect who replaced Saarinen, expanded the concept of the egg stating the structure represented, “the form of the earth, even the universe” as
imagined by the “simple geometrical equation . . . (x²/a² + y²/b² + z²/c² = 1).” Inside this universe was a new kind of motion picture that went beyond simulating a postmodern and created a digital interface through “fiction, in this case [Think], as a model of simulation against which to try out possible reactions.”

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Sometimes in delivering an idea, a notion, you almost have to build a false world, and if you can build a world that is not the ordinary world in which the person lives, he becomes less distracted. This we did by bringing him up into a going show and then, of course, they left the same way.  

Eero Saarinen and the Eameses constructed a false world to simulate the audience’s experience in an immersive, information environment (See Figure 21). Operating as a self-contained laboratory, the Ovoid Theater and Think, intentionally or not, experiments with projecting a fractured, subjective experience to train subjects to produce an objective reality in line with a technocratic ideal.
Paul Rand’s guidebook of the IBM Pavilion described the Eameses constructed world and the multiscreen performance through a visitor’s experience of Information Machine:

Every seat in the twelve tiers of the Wall is taken. About 500 people wait with you to be carried upward into the Information Machine. Suddenly, from an opening in the green canopy overhead, your host drops down, riding a tiny platform. A quick welcome to the Information Machine and he disappears up into the theater as suddenly as he arrives. Then the 60,000-pound Wall carries you smoothly upward in full view of Fairgoers on the ground. You rise into the darkness of the theater, the huge bay through which you enter is drawn up, the world is closed out, and the show begins. You adjust quickly to the dim light inside the Information Machine and soon you make out the multi-faceted interior, the fifteen screens of various shapes and sizes that line the curved wall. Suddenly your host reappears on a balcony before you. As he starts to explain that this is really an Information Machine—because it is a way of telling you quickly and vividly all sorts of facts— the screens burst into a blaze of light and color. Some of the pictures move, some are still and flash on for brief moments before vanishing— but always the pictures, the sound, and the host himself are woven into a coherent whole. At the bidding of the host, information leaps at you from all directions. Just to show what the machine can do, he fills the screens with miscellaneous information about himself— his credit
card, the change in his pocket, what he had for breakfast, what’s inside his closet, even a little chat with his mother up in Schenectady.\textsuperscript{147}

Figure 22: The Multiscreen Performance of Think

Tasked with taking “the curse off the image of the soulless giant computer,”

Charles and Ray used the multiscreen technique to produce an experience where the “viewer discovers for himself that computers are not mysterious.”\textsuperscript{148} Since the early branding of computers as “electronic brains,” computers have been perceived by the

everyday population as threatening to enlightenment ideals and humanity.\textsuperscript{149} Automation, surveillance, and military destruction enabled by computers during the Cold War only served to increase this fear. In 1964, IBM was eager to put forth a new way for the general population to relate to computers. Continuing the work of the Eames’s previous films for IBM, the designers' emphasized the contradiction that the computer and the human brain operate on similar principles. The computer is therefore only an extension of man’s will and wholly natural tool, as well as its incredible and magical ability to solve any problem whether it be homely, social, or complex.\textsuperscript{150} If seven screens were previously thought of as the limits of human perception and were sufficient to persuade hardened Soviets of a potential universal experience and global identity, the Eames must have certainly been testing the persuasive potential of large, open data sets by increasing the number of screens to twenty screens.

**Multiscreen as Liberation?**

Some want to understand the Eameses’ addition of fifteen screens as a form of “expanded cinema,” a concept developed in part thanks to the contributions of their friend and collaborator John Whitney Sr. and later popularized by Gene Youngblood and the counterculture movement. “Expanded Cinema” was part of an intellectual movement that viewed technology and design as a means of liberation through the expansion of sensual, perceptual, and cognitive capacities and employed as part of a


critique of the bureaucratic and technocratic order. During the 1960s, Cyberneticists, media theorists, and designers were increasingly convinced that new electrical technologies and forms of media extended man’s senses by improving perception, the nervous system by improving information processing, and consciousness by improving memory and awareness. As the Machine Age gave way to the Information Age and mechanical operations evolved into electronic systems, the language and buzzwords of these technologies, such as networks, feedback, systems, software, and hardware, moved beyond their pedantic meaning to broader, everyday usage.

Rather simply, Charles dismisses this popular interpretation adamantly defending the employment of the multiscreen technique he developed:

> What has bothered us, if "bothered" is the word, is the frantic use of changing images and an abundance of images for psychedelic effect. The thing that separates our shows from some of the others is that we use multimedia for a very specific reason...We have always been committed to information: it’s not a psychedelic scene in any way.

In combining moving images and stills, and adding inundated bits of information, the Eameses created a disorganized and complex world composed of

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digital relationships. Immersed in this world, viewers receded into an interiority, removing themselves from the physical world outside the theater. The air-conditioned and completely dark and quiet ovoid presented conditions of a laboratory free of formal ideology and control and abundant with feelings of fractured-ness, speculation, and playfulness. In capturing an objective world separate from the perceptual prejudices of its observer, the ovoid theater and the multiscreen exhibition operated much like a camera obscura. As a scientific apparatus, the two-thousand-year-old tool modeled the objective world and empirical knowledge by projecting light into a dark enclosed space to cast an inverted image of the view outside onto its surfaces. The rational interiority of the individual and the accessibility of an objective truth constituting the world outside that interiority are central to the use of the camera obscura and the epistemological treatises aided, such as John Locke’s *Human Understanding* and Descartes’ *Dioptics*. Observation of external phenomenon and reflective introspection as objective rationality dictated the procedures of a philosopher’s or cameral judge’s meditations and continued to be bound up in the methodologies of laboratories and scientists determining scientific truth. The collapse of the camera obscura in the 19th century shifted practices of vision from objectivity to subjectivity. Vision was being understood more in terms of the human body, which suggested that perception is based on subjective senses and are fallible, meaning the idea of an objective reality is misleading. Experiments with retinal after-images in which the eye generated a whole spectrum of colors that are not present reaffirm this identification of vision as just an “amalgam of physiological processes.” This shifts the
observer from his role as a subject of objective vision to an active producer of a subjective, optical experience. Similarly, the Information Machine projected coded bits of language, images, numbers, and symbols, asking audience members to actively employ the same logical methods depicted to create a coherent narrative out of the sensory bombardment.

Many viewers and critics noted that watching the saturated and montaged experience felt as though the presentation was “information overload.” In fact, following her viewing of *Think*, Mina Hamilton responded to the experience of information overload in a way that was common among audience members:

At first, the technique seems eminently suited to the conceptual statement, but the quick succession of images thrown on screens placed widely apart is occasionally confusing, more often frustrating – particularly because of the beauty and precision of each still or “take”…The pace of the show…is so fast that a person does not have enough time (as he does in a static exhibit) to weed out what he wants to see or not see, so the different sets of information are completely haphazard. In a sense, what Eames has done to the film in the IBM show is to present it as a symphony or ballet: a succession of images and sounds move so rapidly across time and space that they cannot be isolated, recognized, or remembered as individual events but they are interwoven to form a total impression. The

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A kaleidoscope-like result is overwhelming and “spectacular” but too fragmented to be entirely successful.156

However, Charles denied their multiscroll technique was designed as a way to overload information and instead claimed:

I don’t really believe we overload, but if that is what it is, we try to use it in a way that heightens the reality of the subject, and where, if the viewer is reduced to only a sampling, that sampling will be true to the spirit of the subject. Maybe after seeing one or two [multiscroll films], the viewer learns to relax…Because the viewer is being led at the cutter’s pace, it can, over a long period, be exhausting. But this technique can deliver a great amount of information in much the same way we naturally perceive it— we did this pretty consciously.157

As a tool for seeing and modeling rapid, fragmented, and complex ways modern humans perceive and attempt to process abundances of information, the multiscroll technology rendered the subconscious processes of brain—primarily decision-making, conscious. Mirroring industry’s division of labor during the Machine Age, Information Age, and now in the New Age, the subject’s mental labor in forming a coherent, objective reality. Disarming consumers of their fears and inculcating them as spectators through an inverted and immaterial pedagogical program disguised as


spectacle, the Eameses mediated the first direct interaction with a computer of as many as 185,000 visitors a day. The designer reified the company-endorsed narrative and capitalist ideology, most directly through the host. Charles revealed the implications of his own efforts in producing consumers, first through material objects, and then political ideologies, and finally through technology in stating:

…it is because as a race, as a culture, we have never been up against the problem of making a free choice. In each case in our own histories why each act calls for a prescribed subsequent act and now not only do we have the opportunity to make a choice but we are forced to make choices, and we are just plain not prepared to make them. So in many respects, this is the problem before us. To sort of build a pattern, structure, by which we can build our own restraints.

In their final multiscreen performance, the Eameses add a host, ostensibly to fulfill the carnival-esque fantasies of the visitors, but also as a way to mediate the spectator’s fantasies. In bow tie and tails, the host descended on a platform from the roof of the pavilion, hovering over the audience. He would begin by “explaining to the audience how the People Wall worked, ensuring that no one would be surprised by what they were about to experience.” The host would “rise up on his platform into the

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theater along with the audience would begin the show with the words; Welcome, Ladies, and Gentlemen, to the Information Machine!"  

Figure 23: The Host of the Eames's *Think* commanding crowds

Instantaneously, the narrative would start explaining “at the bidding of the host, information leaps at you from all directions. ” And finally, during the most difficult and cognitively taxing moments of the film, the host emerged providing resolution. The host was both parts of the performance and a fellow spectator because for the Eameses the host stood in for the designer. Central to their grandson’s characterization of them, Charles and Ray defined the characteristics of a good designer more and more closely with the attributes of a good host, stating:

One day we were talking about what the quality is that really makes an architect, and one of the things we hit upon was the quality of a host. That is, the role of the

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architect or the designer is that of a very thoughtful host, all of whose energy goes into trying to anticipate the needs of his guests— those who would enter the building and use the objects later. We decided that this was a very important ingredient in the design of a building or a useful object.  

The humanist and organicist approach of accommodation, reimagined as the guest/host relationship, becomes re-deployed as an inverted form of imposition. Interactivity emerges from critiques of modernist forms of regulation and homogeneity as well as the reactive forces and identities of postmodern pluralism. In redefining design, empathizing corporate control, and creating interactive media technologies, the Eameses pioneered the reconfiguration of control as it emerged as a dominant technique postindustrial, multinational corporation in the second half of the American Century. Charles and Ray continued to make exhibitions, films, and products, independently and as consultants for their long-time clients at various American universities, the USIA and IBM, until their deaths in 1978 and 1988, respectively.

As late as 2016, film preservationists have been working at the Library of Congress’s National Audio-Visual Conservation Center in Culpeper, Virginia, trying to reconstruct the famous footage of the original 1964 version of Think. On October 30th, 2016, The New York Times published an article A Lost Snippet of Film History, Found in a Home Movie Shot in 1964, that reported the story of a graduate student at the Indiana University Libraries Moving Image Archives. The graduate student discovered a portion of the Eameses’ lost film Think in a can of a 16-milimeter film while watching home movie footage from the 1964 World’s Fair. Speaking to the cultural significance

and defining American experience of the multiscreen show, the IBM Pavilion, the Fair, the Eameses, and midcentury America, Mr. Anen, the graduate student who discovered the film, said, “When people see footage like that, they immediately — don’t contextualize it, but personalize it for themselves,” Mr. Anen said. “So it was, ‘Oh, when did we go, who were we with, is that us in the background?’”

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A Postscript on Control Societies

Did you get the picture?
Charles Eames
One of the most penetrating of the changes is that change which makes our society almost completely dependent on current information, that is, information current, and as contrasted to information that is accumulated. In a traditional society, that is a traditionally oriented society, information is mainly accumulated, and almost any action within this pattern calls for a specific reaction. Today there are very few isolated pockets where this could be said to be true. Ours is a world so threaded with high-frequency interdependence that it acts as one great nervous system. It requires all the feedback controls man has devised to keep from oscillating itself out of existence.\textsuperscript{164} – Charles Eames

In the turn from modernity to postmodernity, one sees a behavioral shift similar to the switch from a complex to a hypercomplex system. Increasing doubt about whether society can control its environment followed the trend of civil society towards skepticism, criticism, and second-order knowledge. Internal differentiation and functional stratification- evidenced in the postwar modernization project through such examples like the academic and industrial specialization coupled with the re-assimilation and redefinition of designers- reveal the recursive integration needed to produce and structure a stable hypercomplex system.\textsuperscript{165} Feedback, an operation informing the reconfiguration of vision, reason, control, calls for democracy as mediated by data, design, and interfaces, not only is first articulated and later popularized by postwar systems theory and communication theory but becomes

\textsuperscript{164} “Eames Celebration,” Architectural Design 36, no. 9 (September 1966): 461.

necessary in understanding the evolutionary processes of the American Century. It is through this feedback loop, as Charles Eames alludes to in the quote above, that objectivity, histories, narratives and power structures are preserved, as we - composites of our identities and affective experiences - are constituted and controlled within the system.

In the second half of the American Century, interactivity, as a new strategy of attention and thereby control, emerged as the solution and engine of a postindustrial economy. The successful re-imagination of the producer/consumer divide as a host/guest relationship, aided in producing the illusion of heightened participation and engagement in political, social, and cultural processes. Ultimately this contributed to the development of new political, economic, industrial, and media technologies that inverted hierarchies and power structures, inspiring integrated systems of computers like Systems/360 that enabled the implementation Neoliberalism and Globalization. The deception of active participation and engagement in political and social processes gives rise to a new counterculture formed in the shadows of giant corporations and international organizations unbound by individual demands for democracy. Exemplary of this are subcultures of Punk promoted by popular bands in the 90s like Nirvana, which is intimately tied to the political movements at the WTO and Occupy Wall Street protests. The acceleration of interactivity led to a rapidly oscillating system, theorized by Jean Baudrillard as:

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Between existence and representation, a world which has witnessed a blurring of
the distinctions between democracy and television, between war and games,
between society and virtuality, between fact and fantasy.  

The interface of the screen and its interactive properties, extended in Charles
and Ray’s multiscreen exhibitions and catalyzed by the capitalist society, risk society,
information society of the American Century has blurred the material and logical
worlds. Ironically, the screen also has the ability to negotiate our interiority and
exteriority, and our narrative unity and objective reality. The philosopher of film, Gilles
Deleuze explains the importance of the screen in matter-of-factly saying, “The brain is
unity. The brain is the screen.”  

Potentially interested in similar relationships of power, society, semiotics, the
phenomenological experience of the individual, and technology, Deleuze wrote
"Postscript on the Societies of Control," in 1992. Built on Foucault’s definition of
disciplinary societies in the eighteenth and nineteenth centuries, Deleuze briefly
touches on societies of sovereignty, and classifies -the current operations of late as
that characteristic of a “society of control”. Highlighting the technological evolution of
machines through each phase of society, Deleuze contends that the society of control


is mutated and enabled by computers, corporations, and design - intimately attached to the work of Charles and Ray. Deleuze historicized the evolution as such:

As for markets, they are conquered sometimes by specialization, sometimes by colonization, sometimes by lowering the costs of production. But in the present situation, capitalism is no longer involved in production, which it often relegates to the Third World... It’s a capitalism of higher-order production... What it wants to sell is services but what it wants to buy is stocks... The conquests of the market are made by grabbing control and no longer by disciplinary training, By fixing the exchange rate much more than by lowering costs, by transformation of the product more than by specialization of production. Corruption thereby gains a new power. Marketing has become the center or the "soul" of the corporation. We are taught that corporations have a soul, which is the most terrifying news in the world.171

The Eameses were integral in cultivating an appearance of a corporate soul through the first house design program. However, during the later years of their lives, Charles and Ray became dissatisfied with the culture of consumerism in America, worrying more about the social responsibility of the designer rather than the solution of problems. Instead of prioritizing consumption, the consumer, and the technocracy, the Eameses promoted making “everyone an active producer and consumer of intellectual material, instead of an avid consumer of goods and products.”172 The prolific husband

171 Ibid.

and wife designers started to think that the main question facing designers would soon
be “should, rather than how we do it.” In one of the Eames Offices last films, Exponents, a sentiment empathetic to Baudrillard’s vision implores us to rethink the accelerating pace of innovation in saying:

Innovations now appear (and start to interact) faster than we as a society can evaluate them…learning to make choices among alternatives already available may now be more urgent, for us as a society, than increasing our rate of innovation. Certainly one of the essentials is good communicative models of what we know- so that all those involved in decisions share the best possible basis for discussion. Our capacity to gather data has outstripped our capacity to model it.

Keith Yamashita, the IBM Charles and Ray Eames Brand Fellow, believes at IBM, “we live in the shadow of what Eliot Noyes and the Eameses, Rand, and Saarinen have done,” says. “It’s the same mission. It’s just different people.” The Eames Office and their contributions to IBM’s design philosophy have influenced many enterprises and institutions and changed the course of the American Century. Design has become essential for organizations. Recently, “design thinking,” has been popularized as a method of “observation of how humans interact with new things,


rapid prototyping and collaboration across multidisciplinary teams—to create everything from consumer services to business strategy.”

To commemorate its 100th anniversary, IBM developed a public exhibition installed at Lincoln Center that drew on the multiscreen exhibition at the IBM World’s Fair Pavilion in 1964 to celebrate the human approach to understanding and to improve the world through science and technology. Visitors walk along side a 123-foot long digital wall streaming real-time data visualizations—showing traffic flow, solar energy, air quality, water usage, and even fraudulent credit card transactions. Then they enter a "media field" theater space made up of 20 seven feet tall, double-sided video panels – amounting to 40 screens in total. Over 100 hours of footage is complemented with visuals, interviews, and data via contiguous screen clusters to induce “new levels of understanding.”

Figure 24: 2011 Multiscreen Think Exhibition

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176 Ibid
The exhibition transforms the environment into “a panopticon of discovery” via the interactive screens. “Experienced as a whole, the three phases of the THINK Exhibit formed a single cerebrally, and aesthetically cohesive narrative – its story arc and impact unimpeded by any actual IBM branding,” or so says IBM and the designers. Eerily enough, the same designers and technologies were used to create a multiscreen “Client Interaction Center” to “see if [Watson cognitive computing system - IBM’s early model of Artificial Intelligence] is a good fit for these companies.”

A year later in 2012, IBM earmarked $100 million to become the largest and most sophisticated design company. IBM tripled its design staff, with 1,300 formally trained designers working in 31 studios from Boston to Böblingen, Germany building

the largest studio network in the world. Their mission is to employ hundreds of designers and train its entire workforce to “think, work, feel like designers.” Put in place long go by the Eameses, as the central tenant to design promoted at IBM’s design boot camps is “Empathy.” Empathy - ability to understand another’s feelings—is used to better connect with colleagues and clients, fully enabling design to complement business and engineering practices.178

The rhetorical re-appearance of “design-thinking” coupled with recent investments in the service of design, specifically focused around interactivity and empathy, gestures towards an apparent acceleration in forthcoming developments of political, economic, industrial, and media technologies. New advanced models of communication, initially based on Shannon’s *Mathematical Theory of Communication*, are finding their ways into the hands of developers and designers more recently than ever.179 Vogue technologies such as deep-learning algorithms and Artificial Intelligence are producing increasingly immersive, interactive, virtual, and complex human-computer interactions, potentially redefining the same issues of vision, reason, objectivity and management that were similarly explored in this thesis. If we are, indeed, on the verge of a new control society problematized by even more complexity,


maybe this story of Charles and Ray Eames or even this generation’s likeness to the great midcentury designers, can affect the course of not only history but also the future.
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