

# Emerging Design Cultures in the “Cyber-Real” Age: The Tales of “Extreme” Architectural Practices

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## REVOLUTIONARY NINETIES?

In this paper, we will argue that even though computers transformed many aspects of architecture, in the nineties, the use of technology in our profession has not been revolutionary. In fact, we will argue that computers were not used, in the nineties, to transform anything fundamentally in the profession. Instead computers were used to support and reinforce the image of what architecture has been throughout the twentieth century.

Professional offices used computers, in the nineties, to make their design, construction, and communication processes more efficient and productive. And a decade later, computers are no longer foreign; in fact many professionals can no longer think or work without staring at them. However, despite this remarkable change, most offices today operate as they did in the previous decades. The majority of architects still deal with drawings, deadlines, consultants, and clients. And most importantly their economic survival is exclusively dependent on the construction of brick and mortar infrastructures.

A similar fate has occurred to a number of young avant-garde firms such as UN Studio, NOX, Oosterhuis, Reiser + Umemoto, O.C.E.A.N., and Greg Lynn's Form. Early in the nineties, these firms became digital pioneers, eliminating first the traditional methods of paper and pencil design, then eliminating the traditional processes of architectural imagination, materiality, and mobility. These offices have built considerable reputations and fame almost entirely by publishing their hallucinogenic designs as quickly as they could invent them. Today, they are obsessed with proving their designs are constructible. However, in spite of the heroic and revolutionary atmosphere that surrounds these efforts, the objectives of this generation are very traditional. These practices have been focused almost exclusively in an area that has fixated the entire avant-garde movement of the past century: the new aesthetic form.



Figure 1. Cover article of Architecture magazine, September 2000. The nineties success of blob design is already an architectural myth. The cover article says: “rarely in any generation does a single academic institution have a sweeping effect on the profession at large, the way Harvard did in the ‘50s under Walter Gropius – and the way Columbia has over the past six years.” Source: Cover Page, Timothy Greenfield-Sanders. “The Computer School.” Architecture Magazine, (September 2000): 93–108.

## BEYOND THE BLOB: AT THE THRESHOLD OF A CYBER-REAL DECADE

In this paper, we will explore how a new generation of architects is attempting to move beyond the productivity or aesthetic gains from digital technologies. These architects can be characterized by being less interested in becoming big stars of built architecture, but more enthusiastic about understanding the new condition of urbanity in the digital era. Their observation is that geographical space is no longer the final frontier of humanity. What is emerging is a mixed reality; a reality which is both cyber and real, synchronous and asynchronous. These designers believe that these new spaces are not created to replace reality but instead to support more effectively contemporary capitalistic behaviors.

The four design firms, which we will explore in the following pages, believe that there is a parallel type of practice: one which can break away from architecture's traditional commitments to the professional world (built square feet) and/ or to the avant-garde circles ("cool" new forms). They believe that a new branch of architecture can help transform space not only physically or aesthetically but communicational and psychologically. They believe that the powers of architectural design can be incremented by several orders of magnitude if one understands how human activities can migrate from pure functional physical infrastructures into the more distributed digital spaces.

### ASYMPTOTE: DESIGNING A CYBER-REAL STOCK EXCHANGE

Five years ago, the New York Stock Exchange (NYSE) began to integrate its myriad of computer data into one easy to use system. In the process of developing the "design" of the new virtual stock exchange system the NYSE contracted the New York based architectural firm, Asymptote.

Asymptote was founded in 1989, and is well recognized in architectural circles for their competition and installation projects that explore the relationship between the digital and physical worlds. This commission was for Asymptote a unique opportunity to build what they had been experimenting with for almost a decade.

The project turned out to be more than just an interface exercise. "We approached it as if it was a traditional architectural project," said Hani Rashid and Lise Anne Couture, founders of Asymptote. The NYSE is full of intensity, jargons, and actions, which must be represented in the virtual exchange in order to be easily understood by the users. The design of the virtual space "had to be a reflection of the intensity and the architectural language of today's NYSE", said Rashid. The fully interactive 3-D Trading Floor (3DTF) consolidates several data streams. On the walls, of the virtual world, there are stock prices, news, indexes, and live video from major television networks, which are constantly flowing in real time. On the floor, of the 3DTF, the trade booths are arranged as they are in the real layout so it is easy for users to understand. A fully interactive 3D graph is situated on the virtual floor; the graph allows for

instant replay of graph-events that occur in the stock market. The 3DTF is depicted on nine 25-inch PixelVision flat-panels, which allows users to access many types of information instantly, something impossible to do in real space or with current databases.

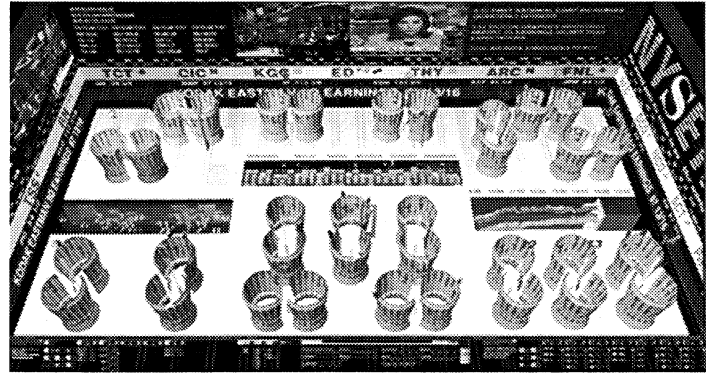


Figure 2. The new NYSE virtual stock exchange, designed by Asymptote, displays a virtual environment in which traders can interact with 3D graphs, real time ticker bands, and video feeds. Source: [www.asymptote.net](http://www.asymptote.net).

"The idea was to create a visual environment through which traders can navigate, analyze, and act upon at-a-glance. Trade actions are very dynamic," said Rashid and Couture. "What happens on the trade floor gets immediately broadcast through the media, information on which the market reacts, and then quickly translated into orders on the floor." On the real trade floor, it is impossible to see and analyze the complex dynamics of these interrelated events. However, in the 3D virtual representation, it is possible to manipulate, even to do instant replays, for quick analysis of the activities that occur on the exchange. "It is incredible to see how engaged operators get in the 3DTF when the market has drastic changes during they day," expressed the architects.

The NYSE initially had contracted a group of engineers, from Silicon Valley, to design the entire project. But they had difficulties designing the data navigation. This led the client to Asymptote. Rashid said, "When the clients saw that all their data could be assembled in a navigable world, they said: Why didn't we hire an architect before?"

The 3DTF project led to a second commission, for Asymptote. The NYSE needed a physical location for this virtual environment. They named the space "Advanced Trading Floor Operation Center." It is a high-tech workplace, or a "theater of operations," for virtual trading. Today the "theater of operations," that houses 3DTF, has become so popular that it is also used to broadcast live updates from the NYSE by several major TV channels, in the US. The Operations Center is powered by 6 Silicon Graphics Onyx2 graphics visualization supercomputers, 43 PixelVision high-resolution, a number of flat-panel monitors, and highly innovative applications.

Currently, the Asymptote principals have high hopes for the future role of architecture in cyberspace. They think that current trends, in Internet commerce, are dull, and current technology does not interact as humans interact with real buildings. "For example the

website of Barnes & Noble is just a glorified magazine page," Rashid said. But that site could be re-designed to contain many of the features and richness of the real bookstore: the lounging, the browsing, and the opportunities to socialize. "This can only be achieved with architecture," points out Rashid.

### ASYMPTOTE: DESIGNING A CYBER-REAL MUSEUM

In the middle of 1999, Asymptote was working on a commission for another large cyber-real project: The Guggenheim Virtual Museum (GVM), for the famous Salomon Guggenheim in New York. The GVM is the most ambitious digital project a museum has attempted in the United States. The Guggenheim is investing one million dollars in the first version of this project. The virtual museum, like the virtual exchange, is expected to have both a real and a digital presence. The GVM is expected to have a physical presence on the video wall (43' by 24') in the Guggenheim Museum location in Soho (New York City). It is expected that the project will be part of the transcontinental expansion of the museum, including sites in Venice and Berlin. With different mediums and via different digital technologies the Guggenheim events could be experienced with the other cities. The GVM is expected to open its virtual doors in 2000-2001.

The first impression of the virtual museum is that it is in constant change. The elements are recognized at first sight: "The Plaza," in which are located the public functions of the museums, "The Ramp" which guides to other Guggenheim museums in the world, and the "Galleries" which introduce the user to the different collections of art. The visitors navigate through the museum with a bar that cuts sections of the 3 main elements of the GVM: "Plaza, Ramp, and Galleries." In the design of the GVM, Asymptote, plays with elements which are very close to the experiences a visitor discovers in the real world: the user develops a sensation of spatial movement, develops a sense of destination, and, above all, is capable to allow users to learn and fixate memory experiences of the information in the virtual environment. This is something very difficult to achieve in today's 2D Internet World. Users tend to surf in a random way, they easily lose their sense of destination and time; it is very difficult to track down or remember location of visited sites. The 3D space of the GVM, developed by Asymptote, is one of the most mature attempts, to date, to develop informatics architecture in which the traditional aspects of architecture: destination and space memory are explored. The virtual environment, according to Asymptote, offers a second level of reality, one in which space can be manipulated by the user. Once the visitor becomes acquainted with the environment one can develop short cuts, which will allow quick access to the information and events desired.

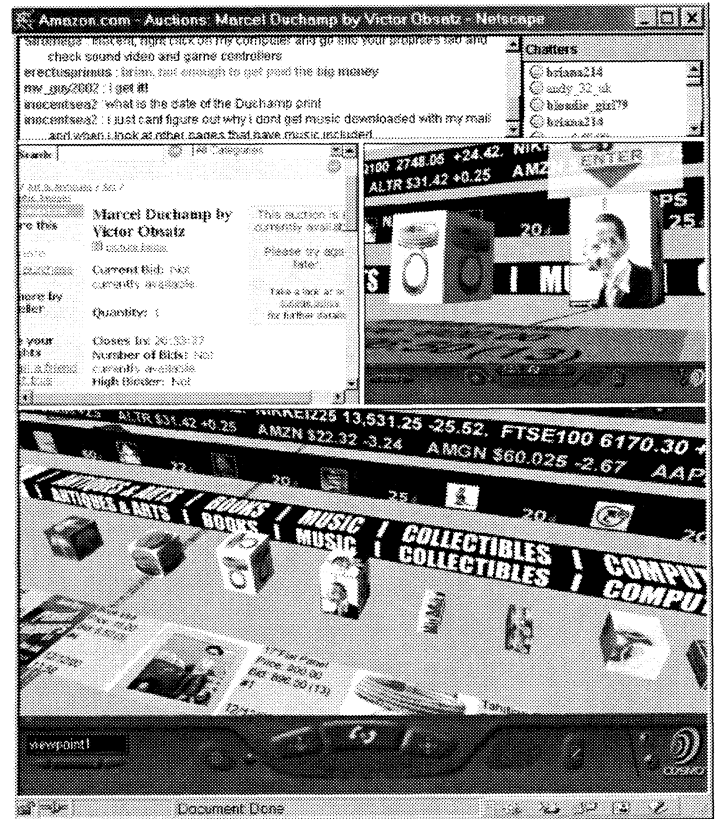


Figure 3. 2069, Inc. prototype of a virtual world that supports Internet navigation in highly interactive web sites such as auction sites, B2B bidding, and stock trading. The architecture of the world is designed to bring together, in one virtual space, the information of several web sites. The user can navigate through the VRML world via two different windows, which allow for different scales of interaction with the information. One frame with the traditional web page and another with chat support the interaction occurring in the VRML world. Actions in any of the frames trigger actions in the other frames.

### M.C. INTERNATIONAL & 2069, INC.: DESIGNING THE SUPERMARKET OF THE FUTURE

The third case that we will present here refers to a series of research and consulting proposals, by the firm M.C. International and 2069, Inc., in the area of grocery shopping in the digital era. M.C. Intl. and 2069, Inc. are a network of architects, designers, industrial designers, software designers, and business consultants in the USA, Latin America, and Europe. The office network was founded to collaborate in the development of designs, technologies, and systems that can anticipate the needs of urban culture in a digital era.

In 1996, M.C. Intl. developed a series of prototype projects reflecting the impact of the Internet on supermarket shopping. The average American spends approximately 25 minutes each time they enter into a grocery business, and an estimated 70% of those who shop do not enjoy the experience. Moreover, the action of shopping in most metropolitan areas, in the United States, involves the action of driving, making the entire experience more than an hour long chore which includes undesirable activities such as finding parking, getting lost in infinite aisles, reading about extraterrestrial abductions in magazines along checkout lines, selecting paper or plastic, carrying heavy bags, and arranging the products on the proper shelf at home. The weekly grocery shopping duty appears to be a mundane burden in every day life considering that at least 50% of the groceries, every American family buys each week, are staple goods that solely replace previous purchases. Computers have improved many of the operations that help run the grocery businesses, but have had little impact in re-engineering the experience, activity, or space in which grocery shopping takes place. For most Americans the once a week shopping ritual has not changed much.

Commerce on the Internet is attempting to transform grocery shopping. For example, Wal-Mart's Web site already sells 300,000 different items: from a Maine Lobster sold for approximately \$48 and delivered live in 24 hours, to a pecan pie sold for \$17, and a pack of chewing gum sold for less than \$1 dollar. Although, it appears that Wal-Mart has exerted effort in designing their web site, it seems that little thought has been placed on understanding how we are to receive the goods. Wal-Mart delivers the products with an overnight carrier, which proves to be inconvenient, and expensive therefore making this experience unattractive. Other companies have attempted to solve the problem at the receiving end. Relatively old companies such as "PeaPod" and new ".com" companies, such as "Web Van," currently receive grocery orders via Internet and telephone, and will deliver for a small fee. They are attempting to change grocery shopping, similar to how Domino's Pizza changed the pizza business.

In the beginning, M.C. Intl. and 2069 Inc. researched the possibilities for combining shopping for groceries on the Internet and receiving those goods in a timely fashion. Their studies suggested that the delivery of groceries to home in less than 24 hours was uneconomical. However, they found that assembling individual orders that could be picked up at a central location was possible in less than 2 hours without major additional costs to the operation. In fact these studies suggested that the savings in supermarket facilities and stocking activities were significant. They reflected on the reality that in many suburban metropolitan areas the action of shopping is very much related to the action of driving. The proposal attempted to integrate both activities by creating metropolitan infrastructures that would allow people to order groceries on the web, or by phone, and receive them as people perform their every day driving.

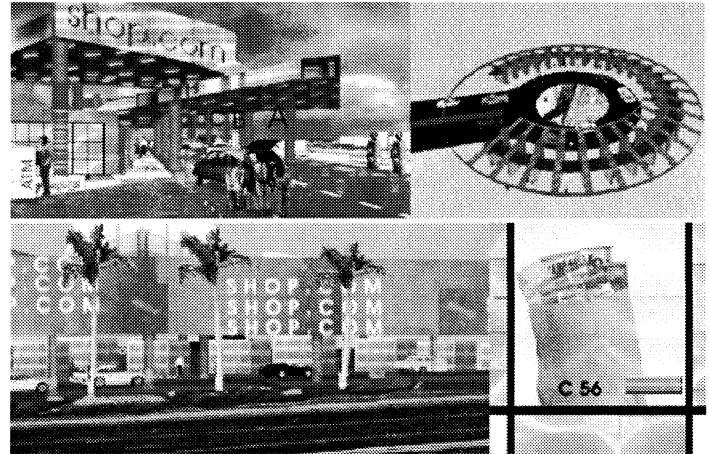


Figure 4. Several prototypes of cyber-real supermarkets, created by M.C. International and 2069, Inc., included the designs of drive-thru infrastructures and software alpha versions. The users shop and buy groceries on the Internet, and then receive the groceries in specially refrigerated mailboxes, in drive-thru infrastructures, near streets or highways with traffic of more than 25,000 cars per day.

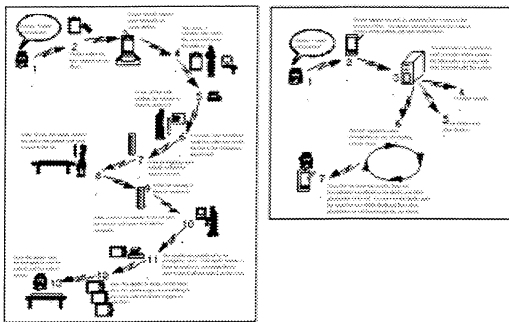
The proposals created drive-thru shopping strips located on the side of highways and freeways, with more than 25,000 cars per day, in which people could receive their grocery orders in specially designed mailboxes. Payments could be collected at the time of ordering or at pick-up. These strips would also attract other kinds of business/activities such as ATM's, gas stations, coffee & donut shops, newspaper stands, fresh produce & bread markets, drycleaners, fast food, and post office centers; this could also be a place for other online retailers to deliver their products. These infrastructures, when compared with traditional supermarkets, not only offer more sales per square foot, and an efficient way of shopping in areas with high vehicular mobility, but also present an extraordinary challenge for designers.

"These drive-thru infrastructures do not have a definite form, they are constantly changing", say the principals at 2069, Inc. They add,

*"These infrastructures are always contemporary. They are like biological organisms that grow and evolve over time. They will follow a similar process of development as ATM's have pursued in the last 10 years in the U.S. ATM's initially appeared inside traditional banks, they later moved to the exterior of banks, then finally expanded to supermarkets, malls, airports, and other locations. Similarly, drive-thru grocery strips may initially emerge adjacent to existing supermarkets, and then slowly migrate to heavy automobile traffic zones."*

**LENON & ASSOCIATES: DESIGNING EMERGENCY ROOMS IN THE DIGITAL ERA.**

Jim Lennon and Associates, a small architectural firm in California, has been developing and using information technology tools to analyze and solve complex design problems in emergency departments. These computer programs analyze and simulate the “activity workflow” inside those departments. These simulations demonstrate that emergency rooms are over-designed and what occurs in them is extremely predictable. Lennon’s studies show that the size and shape of emergency rooms are not only dependent on physical requirements but also on how people communicate, act, and converse, in the space. The simulations demonstrate that a typically patient spends approximately 2.5 to 5 hours in the emergency department while the estimated time spent with the doctor is only 5 minutes. The communication among the staff is precarious, and the time lost is enormous.



The image to the left of figure 5 shows a typical example of the activity workflow that occurs when a patient enters an emergency department in many hospitals today. As part of the design solution, the architects specified a computer system that will act as an information system for doctors and nurses, which will improve the activity workflow. The new information system includes several technologies such as hand-held computers connected to the hospital computer network by wireless modems and earphones. The diagram to the right is the redesigned process. The new process considerably improved the time a patient spent in the emergency departments. This had tremendous implications on improving the efficiency of the physical design of the building.

**KOOLHAAS: THE CYBER-REAL PARADOXES OF DESIGNING A LIBRARY**

Rem Koolhaas with his new office AMO (the mirror name of his former office OMA) is attempting to provide design solutions that are not only translated into creating buildings but in some cases destroying them. Koolhaas began to re-invent his traditional office during the design of the 90 million dollar Seattle Public Library. Koolhaas says that the major question confronting an architect, when designing a library today, is not how the library should be, but if we really need a central public library at the beginning of this digital century. He said, “there is certainty that there will be books, but uncertainty about the varieties of other media” (Wolf 2000). The problem with this uncertainty is that one can make major mistakes in the program of a building which could be replaced for example by a large data-base and a delivery system of books with 100 vans. The solution of the OMA/AMO office for the Seattle Library project was to maintain the building infrastructure. The reason was political and psychological for retaining the North American understanding of what a public library is. However, according to Koolhaas, the design solution for the building is a large database, not digital, but analog. The physical distribution of the library follows the ordering of information in the library computer system. The objective is to create a predictable space so that the user can search for a book or any other type of information in the computer.

Koolhaas’s initial intuition in Seattle was quickly formalized in other new projects in development today. “The relationship between the virtual and real space, in commerce, is deeper,” says Koolhaas. The more that is spent on electronic commerce, the more need there is to capture potential customers in anyplace and at anytime. There is more need to develop real spaces that have political and psychological impact. OMA is designing stores for Prada in three cities in the US: San Francisco, Los Angeles, and New York. The stores not only sell clothes, but they are the psychological support of the brand. The proposal of Koolhaas’ office is to incorporate cultural and hip programs to the traditional clothing store. The idea is to transform these three stores into a pilgrimage destination inside those three world cities. The new combination, OMA/AMO, began to develop another dimension to this project. They began to collaborate with one of the most renowned firms in product and brand design: IDEO. Koolhaas is working with IDEO in order to create a means to dis-

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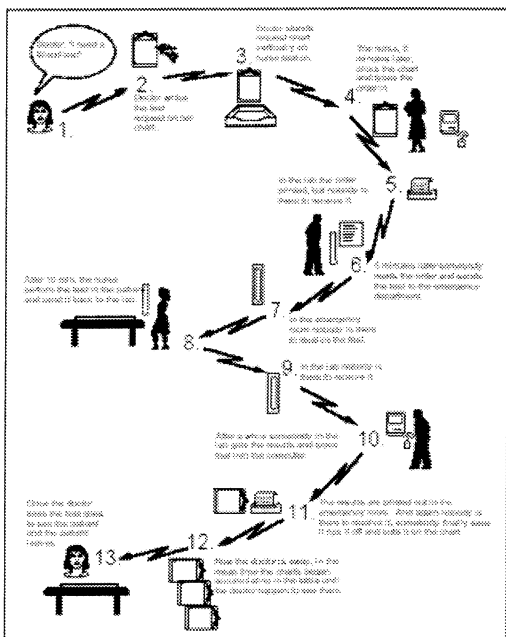


Figure 5. On the left is example of a conversation workflow that occurs when a doctor requests a lab test to be performed, for a patient, in a traditional emergency department. On the right is a diagram showing the redesigned activity workflow by using hand-held computers and audio communication devices in the same emergency department.

tribute the events and architecture of the three Prada stores in cyberspace. So, while OMA designs the physical space of shopping, AMO is trying to reformulate how you shop by embedding technology in the stores with maximum invisibility.

Rem Koolhaas, in a recent interview, said that the objective of his new organization AMO is “to test the basic proposition of the new economy: the fewer atoms you move, the more money you make...is to invent speculative strategies that don’t take geographical space” (Wolf 2000). For Koolhaas and OMA, the “virtual architecture kills three birds with one stone: it offers payment for concepts instead of concrete. It delivers something to clients that match the velocity of their demands. And most important, it supplies an ingenious antidote to claustrophobic global development” (Wolf 2000).

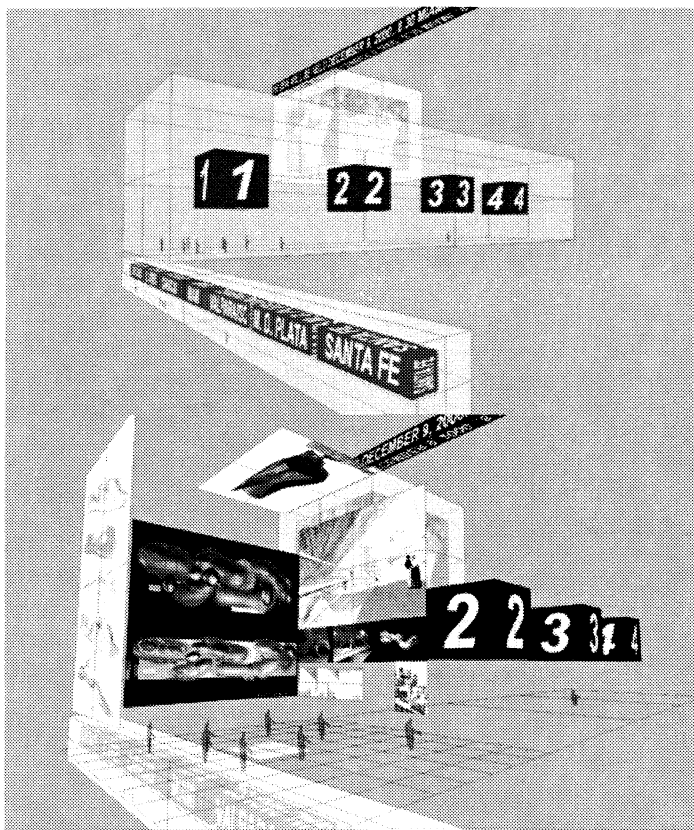


Figure 6. The “Virtual Design Studio Space” prototype named “iStudio,” at Florida International University, investigates the software design and human behavior of architectural studio life with digital conditions. One of the most important aspects in a virtual world is the need to rebuild the human body. Avatars and audio chat are introduced to develop a sense of scale and community.

## CONCLUSION

The four cases, presented above, are more than a temporary design formula. They reveal a flamboyant new state of freedom in architecture that is not compromised with the formal and aesthetic pre-occupation of physical space. It is an architecture that produces and imagines at the threshold of the built and the un-built worlds. Human activities are no longer “functions” in space, but “actions” that can occur anytime and anywhere in real or virtual places. The emergence of an urbanity based on “action,” rather than on “function,” can have important implications to the cultural framework of “design” that has dominated architecture for near 130 years - since the writings of architects such as Viollet-Le-Duc (Viollet-Le-Duc, 1875) and Louis Sullivan (Sullivan, 1956).

Design - either of infrastructures, computers, or human systems - in the digital era, can not only improve the physical conditions of humans but can also drastically advance our capacity to interact - the ultimate potential of urbanity. The most important theoretical claim presented in this paper is that architecture, in a cyber-real era, can no longer be based exclusively on traditional notions of function, form, and aesthetics, but on the study of “action” that grows from the writings of philosophers like Austin (1962), Searle (1969, 1979), Dreyfuss (1972), and computer theorists such as Flores and Winograd (1996). Summarizing, these authors say that human interaction occurs only ultimately at the level of human conversation. Language creates worlds. They say if designers can understand how we converse then we can improve the method in which we shape computer systems, organizations, and human spaces.

Each one of the cases presented in this paper demonstrates a new capacity for architects to observe human conversations in space. By following that principle each solution is modified not only by the visual and corporal experience of the user, but is improved by the design of the actions and communication processes of the activity itself.

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