activities from taking place. And of course we need such domination, we need the security of hospitals, homes and schools, offices, factories and airports. And at other times, we need different kinds of architecture, those which appropriate rather than dominate, those which intervene and attach rather than impose and replace. We need architectures of an impermanent and temporary nature that appear for a few weeks, days or even hours, that do whatever it is that they need to do and then disappear without leaving a trace, except that they remain in the minds of all those who witnessed them. Architecture in this sense is like a seasonal flower, beautiful in its very ephemerality and provisional presence and appreciated not only for what it provides, but also in the knowledge that it will, very soon, be gone.

Play

Play is no laughing matter. Seemingly silly and superficial, play undoubtedly invokes the childish delights of being mischievous and of testing the boundaries of acceptability. Yet underlying its surface veneer of infantilism, play is much, much more: it tells us that aggression in cities is latent and not always detrimental, that being ridiculous is okay, that all of us are in some way children at heart and, above all, that our urban spaces are not there just for purposes of work, tourism, retail and other supposedly important affairs, but also for having fun, for letting go, for, in fact, being ourselves in our full range of emotions and bodily extensions. Play is *serious* fun, and we should all be able to take part.

If play is what we should do, then how does this occur? Here we have much to learn from children, who often see no separation between the world of imagination and fantasy and that of routines and chores. Rather, play exists everywhere – at home, in the schoolyard, in the back of the car – and at all times of the day.

Emotions

Nor need such thoughts always be logical, rational or considered. Our emotions, too, should be nurtured and cultivated. Hence the need for city spaces that make us glad and sad, happy and doleful, excited and calm, delighted and disgusted, pleased and angry, sympathetic and dismissive, intrigued and repelled, energized and relaxed. It is, after all, the quality of emotional life that, for many city dwellers, lies at the heart of urban existence. Without a full range of emotions – that is, without a full range of the meanings and possibilities of how it feels to be human – we are as yet unfulfilled, and the full life of the city is yet to be achieved.

A longer version of this text first appeared as "Thirteen Tactics for the Good Life," in Zoe Ryan (ed.) (2006). *The Good Life: New Public Spaces for Recreation*. Van Alen Institute and Princeton Architectural Press, New York NY.

Ludger Hovestadt

WHY GAMES FOR ARCHITECTURE?

What do we stand to gain from using games for architectural purposes? The current architectural discourse is based on obsolete conceptions of technological realities. Current architectural practice is increasingly faced with economical, technological, ecological and, last but not least, formal and aesthetic problems. Architecture still has a mechanistic view of technology, despite the fact that it can provide the formal and theoretical ingredients necessary for innovation. Architects must develop new interaction schemes – more organic, but with comparable technological embedding in every respect. The construction of games can serve as a paradigm for this. We must expose builders, architects and users to individual measures of provocation, antagonism and reassurance so that modern buildings can be sensibly designed, built and operated.

Many well-known attempts by architects and game designers to capitalize on architectural games have been all too superficially presented and have thus been a welcome excuse for many architects to dismiss the genre as amateur. Yet through these games, palpably effective methods and technologies for more complex and dynamic systems of modeling, control and interaction were developed; these can achieve far more than what is currently possible in architectural practice. My interest lies not in the excited discourse of thrilling phenomenon, but in the search for mutually beneficial interfaces through which fundamental architectural structures can be linked to a game's modeling, production and interaction patterns. Unlike the focus of the majority of the discourse, these interfaces are geared towards everyday usage and demand an unusual amount of labor and patience to be understood.

Modern Architecture

Architects like to follow the "form follows function" design principle articulated in 1896 by Louis Sullivan, American architect and leader of the Chicago School. This maxim characterizes – often incorrectly – the idea behind the International Style, a term coined in a 1932 MoMA exhibition that refers to the minimalistic and functionalistic tendencies of European architecture in the 1920s and 1930s (the Bauhaus, for example), which shaped postwar architecture worldwide.

Sullivan's maxim follows the logic of cause and effect and is therefore an expression of modern thought. The most prominent representatives of modern thought are none other than Newton and his classical mechanics. In the modern way of thinking, objects are no longer described as matter, as they were in the Middle Ages, but as means to possible ends. The core idea in this worldview is energy, which, according to sociologist Daniel Bell *(1976)*, is the "central axis" of industrial society. Production systems no longer depend on people and places, but on machines and global infrastructures. The resultant architectural manifestations of this modern thought are the rastered buildings – disliked by most modern observers – that prescind from concrete matter and serve as a safeguarding system (i.e. infrastructure) for an industrialized, serialized production of buildings.

Information Technology as the Safeguard of Postmodern Thought

From a sociological point of view, the central axis of contemporary society is no longer energy, but rather information.

In physics, the notion of circuits and networks started catching on in the 20th century. Accordingly, the Object was no longer described by its outer, functional properties, but rather understood as belonging to a system of interdependent elements. The new notion thus placed the Object under a new heading: that of "information." In this context, information describes the accretion of improbability within a system (Shannon 1946), and communication is the accretion of information within a system.

Thus what we need for a successful modern system is no longer a trivial – in the mathematical sense – mechanism that functions predictably, but rather a nontrivial and therefore nonpredictable mechanism of adaptation, concentration, balance and provocation.

From the architectural viewpoint of an engineer, it is less interesting that this way of thinking has always been described as a myth, has long been formulated as a philosophy and has been defined for 60 years as a mathematically explicit theory, and more interesting that for the last 30 years, it has been a technical reality (Castells 2004) and thereby a potential tool for the practice of architecture.

This technical reality – which architects have barely even begun to understand – makes it possible to develop buildings with an enormous degree of freedom but without a loss of control, and it provides solutions to existing problems that will produce undreamt-of results. Grids as safeguarding systems are by no means still necessary, but a transformation in the way that buildings are drafted and constructed is.

From Monolithic to Constructed Element

Architects design buildings from "dead" elements. Modern information technology systems, in contrast, consist of objects with functions or even of agents with self-interests. Various examples of modern systems already exist in biology: things like cellular systems, neural networks, spring systems, evolution and emergence all describe systems behavior. The controlled, top-down, coarse-to-fine drafting of a building as a "lifeless" object must be supplemented through the only partially controlled, bottom-up "breeding" of a system performance from a score of far-reaching, largely autonomous, "flexible" elements.

From an information technology point of view, buildings can be happily constructed "from inside to out" on four relatively independent levels: reality, geometry, topology and ontology. This stands in stark contrast to Sullivan's "monolithic" dictum, "form follows function." It also stands in stark contrast to prevailing architectural practice, which is driven primarily by the formal and phenomenological criteria of surfaces while attaching little value to structural criteria.

In this layered system structure, the taxonomy or overall schematic of the building is governed by ontology. The entities and components of a concrete building as well as their shared nexuses are drafted topologically. Geometry determines the form of the building's individual components. And the last layer establishes the way in which the data structures will become reality. Whether it is presented as a photorealistic rendering, a simulation, a code for computer-run machines, a plan for manufacturers or a finished building is, from a structural point of view, irrelevant.

The virtual systematically supports the real. The real is systematically enhanced by the virtual. A division is no longer conceivable. The terms "virtual" and "real" are thus no longer expedient. We live in a postdigital world (Negroponte 1998).

Stageability and the Gateway to Games

In this context, the function of a system is to give its components as much liberty as possible in order to safeguard its coherence from changing surroundings (a building is built to survive more than 100 years). In other words, it must serve the demands of long-term stability and of daily change in equal measure. It is therefore useful to break down a building system into subsystems of various average lifetimes (as is often done in functionalist architecture): the most stable subsystem is the building's shell and possibly its façade, which on average changes only after 50 years. These represent the stage on which the elements of the next subsystem act; these include façade, walls, technical infrastructure, etc., which have an average lifetime of ten years and are, in turn, the stage on which the *next* subsystems act. These include furnishings, technical terminals and so on, which have an average lifetime of two years and serve as the stage for the building's daily use. If we want to anchor games in architecture, then, we must do so on many different levels (up until now, architectural games have only been considered in terms of the everyday level, or subsystem with a two-year lifespan). Because games can take place on various levels, the most important question is: to what extent does a game based on the level of one subsystem make possible a game on the underlying level? Or, in other words, how high is its degree of "stageability" (Walz 2007)?

A New Architectural Practice

When it comes to digital form, architect Frank Gehry is part of the avant-garde. He functions with virtuosity on the top levels of the schema described through ontology, topology, geometry and reality (O-T-G-R). Gehry suggests a consistency even in the lower strata, but only makes use of it in the field of digital media. Games can also be described in O-T-G-R terms. But unlike in Gehry's work, in games, the various layers of the self-contained model gameworlds are integrated as consistently as possible. Let us thus consider several everyday architectural tasks that are handled by, as an example, the CAAD professor at the ETH Zürich in a general O-T-G-R model and describe them in the form of a game.

The Spaces Game (cf. *SimCity, Second Life*)

Players are the prospective inhabitants of a new city district. They make their own choice of plot size, design, financing, neighborhood, particular requirements à propos noise, view and further development. Many of these desires are mutually exclusive. The goal of the game is to fully develop the given building area and thereby fulfill as many of the individual wishes as possible. The example of Heerhugowaard (2005-2007) brings the individual desires of 3,500 prospective inhabitants of a new city district into spatial equilibrium. This represents the solution to a problem with over 50,000 parameters, which could not be approached with the traditional notion of a top-down planning system designed by creative experts.

The Construction Game

In this game, players must construct a geometrically complicated building with a timber frame. They have at their disposal timbers of only one width and must build a stable, traditional timber-frame building without any metallic connections that will withstand varying alpine load, wind and snow conditions. The player who develops the construction with the least weight wins.

The Façade Game

A large structure plays host to many different types of spaces: living rooms, kitchens, offices, shops, hotel rooms... A shop needs plenty of visitors, a hotel room plenty of quiet... Some rooms face south and get a lot of sun, others face north and get all the noise of the train station. For every situation, there is an appropriate façade element. The goal of the game is to find the right façade element faster than the house undergoes reconstruction and the layout of its rooms is changed.

The Wallpaper Game (cf. *Pac-Man*) by Peter Kogler, 1993

In this game, decoration is approached in a new way. The rooms of a building must be wallpapered. In the process, the length of wallpaper may not be cut, but rather only folded. The goal is to fully wallpaper an apartment. With a little strategic planning, new types of ornamentation emerge (Reference example by Peter Kogler 1993).

The Energy Game

The goal of the game is for a house to "survive" one year without fossil fuels. The structure has various harvesting areas for sun and wind energy distributed across Europe. These must heat the house in the winter and cool it in the summer. Unfortunately, the weather doesn't always play along; this is because the game uses current, real-time meteorological data. Moreover, the inhabitants of the edifice have varying habits: they take long showers, leave windows open even in the winter, buy new electronic devices... The player has various technologies at his command, such as heat pumps, blinds, concrete core cooling units, batteries and flywheels, and is also able to praise and criticize the inhabitants. The goal is to procure the greatest possible comfort for the users at the least possible cost, without emitting CO_2.

Why Games?

All the games described operate according to the same principle: they are technical manifestations of the described ways of thinking, and they are more powerful and more adaptable than conventional engineering techniques.

All current techniques share a fundamental problem: they stagnate on a conventional performance level when the users don't challenge them or adequately learn to use them. As examples, one can cite energy-conserving houses, almost all of which degenerate to the performance level of conventional houses after a few years because the users have lost their daily interest in the system.

What we need is thus a new interaction model. Our environment can no longer be operated from the outside through chains of causes and effects like a simple machine. We need to embed the user in the system.

What does the technically supported reality described above have to offer the game? Unlike ways of life before the 1970s, it offers an element constitutive to the game. It offers the "experiment" of experiencing – without existential risk – ways of life limited temporally, spatially and in their content. It also offers, for the first time, the simultaneity of various such experiments. If the descriptions above are correct, an experiment of this kind was always existential and thereby limited neither temporally, spatially nor in its content. If the descriptions above are correct, our technological foundations need these experiments in order to avoid atrophying. For the technological systems, the experiments are the form of essential provocation or conflict necessary for stability.

What do we need from games for architecture? We need practice in the production of these temporally, spatially and content-limited experiments. We need rules, tension and reward in order to embed the user in the experiments. And in terms of the descriptions above, the users, too, need an individual measure of provocation, conflict and validation.

Gone is thus the time when one could hit the light switch, and the light would go on. Now we need esprit to go along with that and, as architects, believe that we can find it in games.

◆ Bell, D. (1973), *The Coming of Post-Industrial Society: A Venture of Social Forecasting*, Basic Books, New York NY. ◆ Castells, M. (1996), *The Information Age: Economy, Society and Culture, Vol. I: The Rise of the Network Society*, Blackwell Publishers, Malden MA & Oxford UK, (Second Edition 2000). / *The Information Age: Economy, Society and Culture, Vol. II: The Power of Identity*, Blackwell Publishers, Malden MA & Oxford UK, (Second Edition 2004). / *The Information Age: Economy, Society and Culture, Vol. III: The End of the Millennium*, Blackwell Publishers, Malden MA & Oxford UK, (Second Edition 2000). ◆ Negroponte, N. (1998), "Beyond Digital," *Wired* vol. 6 no. 12. ◆ Shannon, E. (1948), "A Mathematical Theory of Communication," *Bell System Technical Journal*, vol. 27 (July & October 1948), pp. 379-423 & 623-656. Reprinted in D. Slepian (ed.) (1974), *Key Papers in the Development of Information Theory*, IEEE Press, New York NY. ◆ Walz, S.P. (2007), "Pervasive Persuasive Play: Rhetorical Game Design Tactics For The Ubicomp World," in B.J. Fogg (ed.), *Mobile Persuasion: Perspectives on the Future of Influence*, Elsevier, San Diego CA. [in press].