

<b>WHO USES workplaces and WHY?</b>	<i>Individual goals</i>	<i>Organizational goals</i>	<i>Societal goals</i>		
<b>WHAT IS a workplace — and how does it work?</b>	<i>Desired products and achievements</i>	<i>Organization</i>	<i>People (skill, talent, knowledge)</i>	<i>Resources</i>	<i>Environment (place, tools, equipment)</i>
<b>What makes a workplace GOOD?</b>	<i>Helpful</i>	<i>Dependable</i>	<i>Satisfying (aesthetically, emotionally)</i>	<i>Fair</i>	
<b>Who MAKES workplaces and why?</b>	<i>Occupants</i>	<i>Building management and service industry</i>	<i>Building development and design industry</i>	<i>Regulators</i>	
<b>How does the process FAIL... how must it be CHANGED?</b>	<i>Improve knowledge about desired quality</i>	<i>Improve design to achieve goals</i>	<i>Improve implementation of a good design</i>	<i>Improve operation of the implemented design</i>	

## V. HOW DOES THE PROCESS OF CREATING WORKPLACES FAIL -- AND HOW MUST IT BE CHANGED?

*"The state says I've got to have two smoke alarms in this shop. Fair enough. The bid goes out and we buy smoke alarms for the whole building. Turns out they're particle-sensing instead of heat-sensing, which means that every time I run a saw or a planer, the fire alarm goes off. I told Terry that we needed to replace the two alarm sensors in the shop. But because they cost more than the department estimate, it has to go through the central Purchasing office. It's been two weeks now, I can't run the shop, and nobody's getting their projects done." -- a production manager on his ad company's new display shop.*

Each of the four processes noted in the previous section — occupancy, facility management, building development and construction, and regulation — eventually intersect and have direct impacts on the environment. Using the criteria shown earlier, those who undertake each of these four processes have some intent and responsibility to make workplaces that are reliable, helpful, satisfying, and ethical.

Ideally, the process whereby each set of creators tries to achieve its own goals will also lead to satisfying the goals of the individuals, organizations, and society to whom they are responsible. In many cases the ability of the creators of environments to satisfy their own needs (such as business success) clearly interacts with their ability to satisfy the environmental goals of their clients. Making a profit in the building industry may be

directly linked to satisfying the customer's concurrent needs for a profit-making environment. Creating legislation that is supported by the electorate is often linked to balancing the needs on one set of constituents, such as the building industry, with those of other constituents, such as building occupants. Nevertheless, it is also easy to see how conflicts can emerge and allow inappropriate goals to become dominant.

If a workplace environment fails to achieve the goals of any of its users -- whether individuals, organizations, or society -- it is critical to ask where in the process the failure occurred? Was it a failure of the physical element itself, a faulty piece of equipment or a bad case of industrial engineering? Although this type of flaw certainly exists, other far more common failures stem from not understanding the basic goals of the users; from having a good object in the wrong place or at the wrong time; and from having two good objects in conflict with one another. These kinds of failures make up a great number of workplace deficiencies exactly because the workplace system is so complex and because so many groups come together in its creation, each trying to maximize their own outcomes without concern (or even knowledge) of the others.

Put another way, the failures of creating effective workplaces are not necessarily failures of technology or skill in construction and manufacturing, but failures of the environmental decision-making process. Communication has failed; either between different members of the creation side or between those who create workplaces and those who use them.

Four primary types of failures occur. In the first type, decision makers have a *lack of knowledge about the environmental goals* of some or all of the users. Examples of this failure abound in the built environment, most often when builders and designers simply do not include one or more important participants in the planning process, when they deal with an unknown client or when the client does not represent the final user. As a great deal of office construction has moved away from "headquarters buildings" for a particular company and into speculative lease space, this problem has become even more widespread.

A second basic failure stems from decision makers who understand the environmental goals of the users, but somehow still create designs *that do not correspond to those environmental goals*. This can occur through incomplete resolution of conflicting goals in the planning process, through lack of information and precedents which designers can draw upon for creative problem solving, or through a lack of one or more resources needed to support a successful design.

A third and also frequent failure occurs when a good design is created, one which incorporates reasonable responses to all of the users' goals, but an *improper implementation* somehow occurs. This is extraordinarily common, given the great number of participants in the building creation process. As installation goes on in the field, designers, engineers, facility managers, contractors and their workers must make innumerable decisions which cannot have been predicted beforehand. Each person will generally make these decisions on the basis of how their particular process will best be served, whether that process be HVAC or waterproofing or construction finance or the coordination of contractors. The intersection between all of these diverse processes, which ultimately determines the nature of the final workplace, can often be left unconsidered.

And finally, a design can be thoughtful, well-planned and carefully implemented, and still be operated in a way which minimizes its effectiveness or even defeats its purpose. This can come from a lack of knowledge on the part of those charged with operation, or from a lack of correspondence between an organization's underlying principles and its operational strategies.

Each of these four types of error needs to be understood as it relates to the overall decision making process. How do these errors relate to different types of environmental goals? Is one type of error more common at a particular type of decision maker or stage in the process? All of these questions need to be addressed in order to prescribe actions that can help improve our workplaces.

**Table 2. How do EQ Criteria Interact with Common Errors in Building Creation?**

	<i>knowledge about user needs</i>	<i>ability to design a good solution</i>	<i>solution implemented and operated</i>
<b>Helpful</b>	must design with user needs in mind	too many divergent needs may be insoluble	intersections between partial solutions may reduce the helpfulness of each
<b>Dependable</b>	once needs are found, they must be made explicit and codified	needs are known, but solutions may depend too closely on ideal inputs or conditions	intersections between partial solutions may reduce the dependability of each
<b>Emotionally Satisfying</b>	these needs are difficult to discover and to state	the role of art	the completely designed and well-thought solution
<b>Ethical</b>	everyone's needs must be considered	all needs are known, but some may be unnecessarily favored over others	last-minute field decisions may undermine the inclusiveness and fairness of the design solution

Table 2 shows the three aspects of creation failures compared against the four basic criteria for environmental quality. To ensure that new knowledge is well integrated and made into sound and responsive designs, the four goals of dependability, helpfulness, satisfaction and ethics must be given specific benchmarks for the particular workplace in question, criteria which can easily be compared against the developing design in order to evaluate progress. This again is a process which must involve all of the ultimate users of the workplace.

We can also see from this table that knowledge of user needs, although critical to the success of the workplace, is only the first step toward the creation of good workplace environments. Clearly, more knowledge is always advisable in a decision making context, but is only usable when focused and coordinated toward the achievement of specific goals. The design process itself, as the potential center of the coordination effort, is vital to the end result, and the implementation process perhaps most critical of all.

Paradoxically, one of the reasons that the gaps among building creators and between creators and users have grown so large is because we have become increasingly concerned with the certainty and predictability of the design and construction processes. In our drive to make the building creation process both more efficient and less liable, we have depended far more upon formal procedural mechanisms such as codes and contracts and standards of conduct, and far less upon information gathering and consensus building and coordination between diverse participants and duties. Precedents and prototypes and repetition are seen as the most likely paths to success, while participation and collaboration are seen as inefficient, political, time consuming, and perhaps even dangerous.

Table 3 shows the three aspects of creation (knowledge, design and implementation) compared against the four participants in the creation process. All too often, the regulation side is thought of as the ultimate arbiter between divergent user needs; in our litigious era, the regulatory process has come to be more and more involved in the proscriptive tasks involved in design and implementation. Our drive to increase the certainty and efficiency of building design and implementation has, to a large extent, resulted in an inability to state and understand the environmental goals of both the users and the other creators of the workplace except through conflict and regulation.

**Table 3. How do Creation Processes Interact with Common Errors of Building Creation?**

	<i>Knowledge</i>	<i>Design</i>	<i>Implementation and Operation</i>
<i>Occupants</i>	They know their individual criteria, but don't always share them	They need more skills and assistance to participate in design decisions	They need more responsibility, opportunity and accountability
<i>Facility Managers</i>	They need to learn organizational and social goals	They need more skills and greater responsibility in design decisions	They need more participation and responsibility
<i>Building Industry</i>	They have a strong concern, but don't know how to judge "who's right"	They need to learn "team design," participatory and collaborative methods	They need coordination between participants and tasks, and less liability
<i>Regulators</i>	The often fail to recognize diversity and project specifics	They need performance rather than prescriptive criteria	They need a clear delegation of authority and performance criteria

In order to ensure that designers understand the goals of all of the ultimate users of the building, we need to ensure that those users are encouraged and assisted in making their needs clear, and in negotiating between conflicting goals. This has traditionally been part of the architectural task of programming, but must be made more robust and inclusive, with information actively sought out from all potential participants. Designers must provide users with more opportunities and processes to state their goals, and provide themselves with the tools that are necessary to understand them.

Unfortunately, the knowledge aspects of building creation are becoming as diverse and specialized as the building industry itself, with the research that is being done in the area of environmental quality often based on one narrow aspect of environmental quality to the exclusion of all others. One particular trade group or manufacturer's consortium or professional organization has a specific problem that they need to address in order to carry out their own role more effectively, and they sponsor research which addresses that problem directly, leaving aside consideration for larger systemic effects.

This compartmentalization extends beyond research practice and into communication as well. When the American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) does research into workplace comfort, for instance, the results often stay buried in the *ASHRAE Journal* when there is a much larger need for this information by architects, interior designers, lighting designers, furniture manufacturers, lenders, facility managers and even workers themselves. In an age where most environmental

quality problems stem from failures of implementation and coordination, the study of narrow and trade-specific technical problems can in fact be counterproductive to the larger goals of workplace quality. As long as there is no central place for environmental quality as a overarching goal -- both for building and for building research -- problems of implementation, coordination and communication among well-meaning specialists will increase.

Traditionally, the architect has played the role of the coordinator of the creation process; assisting the client in listing his or her needs, hiring and coordinating the trades, acting as the client's agent in all transactions. Now, however, the act of building has become so complex (and expensive and litigious) that the architect's role has been minimized. The architect is often brought in when many of the most central decisions about the building — its size, orientation, site, basic uses, and others — have already been made on the basis of financial and real estate criteria.

Unfortunately, the architectural community have responded to these developments not by expanding their knowledge of the processes of building creation and striving to maintain their central role, but rather by drawing back their area of expertise into the one field which hasn't been encroached upon, that of creating form and visual design. Parts of the building creation sequence which had traditionally been the architects' province are now being handled by interior designers, structural engineers, facility managers, maintenance engineers, and even bankers.

The problem, though, is not so much that architecture is a fading discipline as that no other discipline has stepped in to take on architecture's traditional role as coordinator. Construction managers are often thought of as the new integrators, but they coordinate design implementation only, and not the knowledge and design phases. If most environmental quality failures are due to conflict between diverse needs, the need for coordination is clear. In an enormously complex process involving so many players, it is absolutely essential that some knowledgeable professional is able to insist on a systemic, start-to-finish view of the whole, avoiding the ever-more common problems of conflict between two good solutions.

To create better workplaces, we need a building creation process which allows the skills of the creators to work in collaboration rather than competition. The outcome of each profession and each trade must be focused on the criteria set for the project, rather than against internal benchmarks which are uniform from job to job and year to year. Each of the participants in the creation process must learn to — and be allowed to — accept more

latitude in their standard practices, to accept less certainty and more interplay, with the overall criteria set at the center of all efforts.

We feel that it is necessary for some person or group of people to be ultimately responsible for ensuring that these three processes occur, facilitating the flow of information between creators and users and between different groups of creators. It may be that this facilitation role should be within the domain of an emergent and vibrant new architectural profession which regains its traditional role of coordination. It may be that facilitation is best done by independent professionals drawn from disciplines already skilled in information transfer and interpersonal mediation. Or it may be that environmental quality facilitation is an entirely new field, one which will require new training and the development of new techniques.

Regardless of the ultimate identity of the environmental quality supervisor, that person or group will have at least five specific tasks that they will have to perform:

- *gather the best knowledge available* on various environmental quality problems, disseminate it, and try to integrate it;
- *continue to coordinate and conduct research* on the gaps in our knowledge;
- *bring key people together* in forums where they can brainstorm and create new systemic environmental quality ideas;
- go into the field and *facilitate collaborative pursuits* of healthy workplaces; and
- *educate new groups of professionals* who understand the complex system of workplace creation, and who are willing to take on the new kind of collaborative stance necessary to ensure its success.