

Do Open Plan Offices Work?

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Presented at Facility Forum 2001, this paper by Jay Brand explores why many open office installations seem to fall short of their constituencies' expectations and goals.

Introduction and Review

To understand current issues in open plan office development, we must first briefly review its historical context. The earliest business offices of the modern era were essentially "open" rooms housing rows upon rows of desks. These desks typically supported a single worker (mostly clerks) using an adding machine; "outputs" involved records, contracts, schedules, and other legal and logistics documents for railroad companies. Typewriters were eventually added to these desktops, but at this stage "offices" essentially represented production systems modeled on the assembly lines developed by Frederick Winslow Taylor and made famous by Henry Ford. Gradually, as corporations in other industries began to develop, and more heterogeneity among work functions appeared, office spaces began to introduce space divisions and other demarcations to reflect status, thus supporting the organizational hierarchies derived from the military notion of a "command and control structure."

This emphasis on inputs filtered through a command and control structure resulting in outputs of efficiency and production dominated

throughout the first half of the twentieth century. Often in the early days of the modern office, a single individual or a small group of individuals made decisions that required the rest of an "egalitarian" work force to implement, and thus the vast, single-room "open office" was born--although it would be some time yet before the intentional design concept of an "open plan office" would rise to prominence. Private offices for the "business leaders & decision makers" became additions to these early "bullpen" arrangements in due course.

Beginning in the fifties in Europe and continuing in the sixties in America, the Bürolandschaft (literally, "office landscape") idea first developed by Eberhard and Wolfgang Schnelle's "Quickborner Team" (based in Quickborn, a suburb of Hamburg, West Germany) became highly influential. In their ideal implementation, landscaped offices represented "ecologically-inspired settings in which each worker is an active participant." This approach to office design thus pre-dated the currently popular notions of both environmental sustainability; open, barrier-free areas featuring organic, nonlinear space differentiation; and incorporating natural elements into the built environment. In fact, it also embodied the

contemporary emphases on personal control for individual workers and communication-based (now more commonly called "collaboration" or "teaming") office layouts.

Of course, a "linear" historical reconstruction of any important development fails to capture the many counter-currents and balancing eddies that also influenced the character of the movement. For example, human factors and ergonomics has and continues to have an important impact on office environments through product design and evaluation, organizational design and development, human-centered design and usability testing. The occupant-centered approach outlined below borrows heavily from the conceptual approach of human factors and ergonomics. In fact, the Human Factors & Ergonomics Society (www.hfes.org) remains an important resource for ensuring that the products, processes, and environments of the future conform to human capabilities, requirements, and limitations.

Bridging from History to the Present

We now turn to issues that involve conflicts and conundrums still very much with us as we begin the 21st century. Perhaps in a worthy but misdirected effort to cut costs, many designers of landscaped offices soon began to implement the concept purely as a design idea rather than as a reflection of what could be accomplished for occupants by the change in office concept. Without a fundamental understanding of the contextual foundations of organizational effectiveness for a particular corporation—lines/directions of communication, work process analyses, task analyses, worker responses to their environment—to inform the design, some of the later instantiations of the Quickborner team's approach proved to be a disappointment. Workers found many of these environments noisy, crowded, and disorganized. Stripped of the scientific analyses that could have provided

much-needed problem definitions and resultant design solutions, open plan offices during the seventies and eighties were as often a failure as a success.

Although crowding and some of the other more psychological issues raised by landscaped offices as alternatives to private offices went underground, noise levels could easily be quantified, and office furniture manufacturers in short order provided acoustic panels to address this issue. Along with Robert Propst's idea for the "Action Office" as a system of modular components that could be reconfigured in a number of different ways to provide the flexibility of work settings necessary to support the increasing variety of tasks engaged in by office workers, acoustic panels became a staple of open plan offices. As open plan offices and the manufacturers who provided products for them became more and more product-centered, product development turned from providing components within a globally integrated environmental solution, to independent design solutions addressing some presumed problem. So panels solved noise and visual distraction problems; sound masking and ceiling tiles solved privacy problems; filing cabinets, pedestals, and overhead bins solved storage problems; wheels solved mobility problems; universal designs solved flexibility problems, etc.

Unfortunately, all these presumed problems addressed by these products had become isolated from their original human-centered definitions, and thus measures of both problems and their solutions became defined solely in objective terms generically referred to as "building performance." Manufacturers and designers could thus claim that their design and product solutions met certain engineering specifications or reached some objective standard of performance, defined by criteria that had become dissociated from their original occupant-centered intentions. In most cases it became possible to

complete a punch list for a new office space before it contained any occupants! One example involves NRC and STC measures for acoustic panels or acoustic ceiling tiles; these measures are defined and measured in physical terms under arbitrary, laboratory conditions rather than in occupant-centered terms (such as AI, or articulation index, a measure related to speech intelligibility) after the products comprise a portion of an actual open office environment.

The Recent Past

In the 1980s, as real estate prices began to skyrocket, panel systems furniture became the means whereby more and more workers could be placed into smaller and smaller spaces. The original, worker-centered ideas that replaced hierarchy-protecting private offices and their stuffy isolation with egalitarian, landscaped office environments got lost in the shuffle to streamline operations and increase cost-effectiveness. Along with the emphasis on occupant-centered design, the technical disciplines previously seen as important for ensuring the success of an open plan office were also jettisoned. After all, developing adequate models for the acoustics, lighting, daylighting, and thermal conditions throughout an open plan office seemed to be wasted expense, since architects and designers knew all about that "people stuff" already and incorporated it into their interior plans and layouts through the "programming process."

Even though in most cases Facility Managers wanted to provide adequate work environments for their workers, they were increasingly placed by executive management in the uncomfortable position of "gate-keeper" to minimize cost expenditures: "Do more with less, and finish it yesterday." Many of Facility Managers' support functions are still viewed as "cost centers" by unenlightened executives, and in the vast majority of cases, any innovative

suggestions for office organizations from either designers or workers meet their demise in some budget review process.

Many office furniture manufacturers have also claimed that their open plan office systems can actually change corporate culture in several important ways: Hierarchies can be shifted toward egalitarian, sharing communities; independent, isolated workers engaged in mere process support can morph into creative, innovative teams motivated by their collective contributions to organizational goals; linear thinking can give way to constrained chaos; plodding corporate behemoths can become learning organizations; in short, "old" ways of working can be replaced by "new" ways of working. As laudable as many or all of these goals might be, only isolated, anecdotal evidence exists to support any of these claims concerning the benefits of moving an organization away from private toward open plan offices. The available occupant-centered evidence paints a far different picture: A disgruntled, distracted, stressed-out workforce, with noise (in particular, speech noise) representing a significant part of the problem.

Defining the Problem(s)

What's the solution? New and better office furniture systems? Better acoustic panels? Better lighting? Better sound masking systems? Better ceiling tiles? More organic, sustainable designs? Decreasing density? Figuring out how to measure "knowledge worker" productivity? Creating demonstrations of occupant-centered designs that decrease turnover, increase satisfaction, and improve organizational performance? Providing positive "bottom-line" evidence for improving the design of open plan offices? I think all of these accomplishments can only benefit office workers, but to provide coherence to a currently very fragmented process, the occupant must take center-stage in our new construction projects, in our product

design and development efforts, in our architecture and design of new office buildings, and in our evaluation of each of these stages in the process. We must define problems, design their solutions, and measure our success in terms of occupants, referred to in our industry as "end-users."

Measurement of both the physical environment and its occupants are necessary to explore the relationship between the two. What features of the physical environment drive occupants' perceptions of privacy, for example? Is it enclosure? Lighting? Sound masking? High or low ceilings? Psychologists have established that psychological perception mediates the direct influence of most environmental stressors on the body. What influence do the various features of the built environment have on psychological responses to those environments? Can the design of the built environment be used to cue its occupants in positive ways? How can we evaluate success for office space projects in terms of occupant criteria in addition to engineering and building performance specifications?

A Consortium on the Cutting Edge

A design consulting consortium called the OPWG (Open Plan Working Group) coordinated by Orfield Laboratories, Inc., in Minneapolis, MN, has begun to address these and other related issues. Sponsored by a number of major product vendors, the group has developed methods to better inform office projects at a number of different stages, concentrated at both the "front end" (preplanning; planning; and pre-programming) and "back end" (post-occupancy evaluations; demonstrations of having met specific occupant-centered building performance criteria) of construction and installation projects.

The approach combines acoustic, lighting, thermal, daylighting, and aesthetic modeling with occupant measurement to produce open plan offices that not only

minimize the number of worker complaints—not only provide adequate support for office work—but also cue workers in positive ways to increase job satisfaction, decrease turnover, and improve organizational effectiveness. Only a few projects have been undertaken, but the promising results so far encourage us that our occupant-centered approach will ultimately prove to be the right emphasis.

We believe that traditional programming methods must be supplemented by indirect, quantitative measurement of occupants. Several lines of evidence support this belief. First, quantitative assessment provides better predictive validity than qualitative approaches such as focus groups or interviews. Second, most people are unaware of many of the important ways their environment affects them, so direct evaluation methods cannot capture these nuances. Finally, since subjective measurement remains critical for optimal schematic design, it must be quantitative, indirect, and representative of organizational members and their culture.

Do open plan offices work? Yes and no. If they're simply collections of products each claiming to solve a particular isolated problem defined solely in objective terms, then the likely answer is no. But if they're integrated, environmental solutions to problems defined and measured in terms of their occupants (end-users), then they can support cultural change without sacrificing individual worker satisfaction. "New ways of working" cannot be driven solely by a change in the environment. Leadership style & vision, compensation & incentive systems, the current corporate culture, and organizational goals & strategies must all be integrated so that each subsystem converges on the same vision for change. For example, if the compensation system is competitive among workers, an open plan office will not successfully compel collaboration and the open sharing of knowledge among (or even within) work groups.

Concluding Comments about Change Management

In support of a change from traditional, private offices to an open plan office environment, a commitment to open communication and cooperation should be adopted to ensure the long-term success of the venture. Executive leadership must provide a vision and rationale for the change, middle management must be convinced of its value for them, and workers must perceive that they have a voice in the design and implementation process. Design cannot be accomplished democratically, but anything that can be done to provide the perception of genuine two-way communication, genuine choices and options, and functionally based reasons for any radical or novel alterations will improve the success of new buildings and new installations—defined in terms of the occupant. Occupant-centered design, occupant-centered change processes, and occupant-centered evaluation of success—these mantras can ensure that your open plan office works.