Open plan offices: kill or cure?

Adrian Leaman
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Communication

The first open plan offices saved infrastructure costs by making offices wide, deep and open. This meant that a greater proportion of the total budget, so the thinking went, could be spent on fitting out the space, and more thought given to its physical environment (the heating, lighting and ventilation), layout and furniture. It also stimulated innovation in the design disciplines, giving, for instance, integrated environmental design (long gone, and not lamented), systems furniture and space planning (both still with us). The main point was to improve human communications.

As a general rule, communication has improved in open plan, but only where the space and people have been managed properly. Economies of scale were achieved in the first costs of space and services, but this quantitative advantage is lost if the day-to-day management and maintenance is under-resourced. Gaining qualitative ground overall means not just improving the interior fit-out but also paying more attention to the people, their tasks, work, habits and complaints. Open-plan offices which have not followed this path almost invariably fail in one way or another. They are more than likely to be too hot (and too cold at the same time), noisy, difficult to re-configure (in spite of designer's promises to the contrary) and too crowded (especially with lack of space for filing, and lack of space for meetings). Sometimes they are dirty and extremely unpleasant as well. Communications may have been improved, but, in many instances, at too great a cost to the staff.

Control

Open plan is also one of the theatres of a modern design paradox. As spaces have grown bigger, so has the demand for engineering services to keep them comfortable for their occupants. Many newer offices now have larger demands for cooling than for heating. In some instances, heating plant does not need to run at all because of the extra heat generated by lighting, equipment and occupants. Building services, through refined control systems, are increasingly able to produce predictable temperature ranges and cope with rising air quality and ventilation demands. In order to achieve this, though, control has been automated, and progressively taken away from the office occupants. The paradox is that the better the objective conditions, the less tolerant people seem to be of the conditions, so that it is now possible for buildings which actually improve the objective environmental conditions to be liked less by their occupants.

People seem to like more direct control because it gives them instantaneous responses when they are uncomfortable. Where

control has been taken away from the occupants, in sealed air-conditioned environments, for instance, it must be compensated for by sensitive and rapid management reactions. If it is not, then people will complain.

Control is not simply about light switches, or opening windows, or adjusting chairs - the things that provide individuals with personal comfort. It is also about how people can adjust their environment in relationship to the requirements of their work tasks and the relative needs of people around them in working groups. This type of control is probably more important to most office workers - people will put up with some personal discomfort as long as they can carry out their work professionally and to the best effect. But if they find that they are both uncomfortable and cannot carry out their work properly, then they will resent it. So the key to a successful open plan space is not solely individual comfort or space requirements (important as they are), but how people control their environment to support working together in groups (which is the most important thing of all). The missing factor in providing a rationally designed environment which maximises both communication and control, then, is the working group.

Working groups

Working groups are hardly ever thought about, especially in the early stages of office planning. Witness, in most open plans, the complete lack of fit between where people sit and where the controls are located for lighting, temperature and fresh air. People will often work in small groups, usually of between four and six each, but rarely will that group have logical, local control over the noise, light, temperature, glare and intrusion in their area. A common problem is that if the lights are on for one person on the floor, they are on for everyone. If one person wants the windows open, then everyone will have to put up with it. Often as not, the windows will be closed and the lights switched on, whatever the conditions outside and whatever the overall vote of people inside. In addition, the layout of the control zones will not only be different for lighting, heating and fresh air, but they will also tend to conflict with the seating arrangements of working groups. The seating arrangements themselves will often have been determined by a space plan which was concerned almost entirely with fitting workstations onto the floor, rather than with how the pattern of workstations reflected the communication patterns of people on the floor.

The reason why this happens is that no-one thinks about it, at least not until after the move-in day when they begin to understand

the consequences. Then, the furniture layout will be changed to try to accommodate the real working arrangements. This may eventually help to improve communications, but it will not improve environmental control.

People try to deal with poor control design in four ways: by gerrymandering (rows of filing cabinets used as makeshift screens to create boundaries); power games (managers appropriate the window seats); technical fixes (fans in summer, fan heaters in winter, ionizers); or by bodges (cardboard boxes used as shades against glare on VDU screens). All such can make environmental problems worse for the majority, not better. Walls of filing cabinets affect air movement and views out of windows. Managers may have desks by windows (especially south-west-facing ones with good views out) but as they tend to sit at their desks less than the rest of the staff, they do not make the best use of the space. Adding piecemeal technology like fans can improve comfort conditions for single individuals, but worsen them for everyone else by making the office hotter and noisier (and less safe if multiblocks and cables are arbitrarily added). Bodges, such as light diffusing prisms stuck to VDUs, or handwritten notices, are almost always against the wider interest, because they can be unsafe, or because they make the office look unkempt and imply that housekeeping and management standards are low.

All these indicate that the office is failing its occupants, and that, by implication, the space is under-managed and poorly designed. Most of the occupants' responses, though, will be rational. People who create enclaves with filing cabinets are not, as the common fallacy goes, slavishly obeying an instinctive "territorial" imperative. They are trying to improve, albeit crudely and sometimes ostentatiously, their comfort and working conditions, especially those created by disturbances from unwanted movement and noise. As an illustration of what people have to put up with, a study by Building Use Studies of an open-plan office early in 1992 found that sixty per cent of staff were sitting directly next to a primary circulation route, teapoint, photocopier or toilet - all activities which generate noise and disturbances, and which are not directly associated with immediate work tasks. In general, people *like* noise as long as it is relevant to what they are doing and as long as they can get away from it when they want to. The noise of close associates is much better than random, irrelevant noise.

The tell-tale signs of poor working group design are beehive or hexagonal patterns of systems furniture; screens and partitions set so that people cannot stay within line-of-sight or earshot of each other;

workstations laid out like *grand prix* cars on a starting grid; or the same cruciform pattern of workstations branded throughout the floor. There are more serious cases: workstations crammed into floors so that they butt up against air handling units, thereby degrading the units' performance; or cabling constraints which mean that the desks have to be linked together to create cabling runs, ignoring who sits where. Workstation layout is often driven by the organization chart, not real need, or, worse, by culture change imposed on staff through the space plan. Undifferentiated open-plan prairies (often created in the name of more lateral, freer organization structures) can take away identities, not just of individuals, but also of teams. Individuals try and compensate by personalizing their own spaces - against corporate policy, of course (Garfields crawling up VDUs, family photographs, nameplates on desks, fluffy spiders hanging off uplighters). Project teams have a harder time overcoming the blandness, especially where they are not allowed to control the secondary intrusion of people walking into their areas, or change the location of the furniture (and woe betide those who do). These are all factors which are important to people, but often intangible to poorly-briefed or unthinking designers. Recently, design companies have been offering *building identity* services to help overcome this perceived loss of clarity on the office floor.

Complexity

The difficulty of coherently designing for working groups and their needs, especially in speculatively-built offices (which by definition have no individual brief for tenants) is one outcome of the growing complexity of the modern office. Complexity is nothing new, societies evolve by constantly creating more differentiated forms and spending more resources on managing them. In office buildings, this complexity, and the resulting specialization, is becoming more and more obvious as organizations demand greater value and performance from their buildings. But, like other building types, such as 1960s high-rise housing, designers often unwittingly create unmanageable complexity in the name of progress (and over-demanding clients), sometimes with dire social consequences. Complexity in offices comes from at least three sources: technology, space and behaviour, with technology at the top of the list.

To most people (because they are led to think so) technology is perceived as a solution, not a problem. Engineers who provide building services technology think this way. Increasingly, buildings are filling up with technologies (like chillers or air-handling units) all of which can seen as, and are sold as, perfectly rational "solutions" in

their own right. The false promise of such technology, as Bill Bordass of William Bordass Associates describes it, is that it is "maintenance-free, standardized, space-efficient, highly-serviced, automatic, intelligent and flexible". The trouble is that building services technology is rarely any of these, as is increasingly proved in practice. In fact, technology appears to be outstripping building managers' abilities to understand how it works and keep it running efficiently. This is partly a management problem - on-site staff often do not understand how plant works - but it is also a design problem: designers themselves are increasingly relying on the ability of services technology to undo problems that they may have created because of their inadequate understanding of building performance. Designers tend to over-elaboration, and are themselves seduced by the false promises. So, as technology increases in complexity, especially in the number of ways in which different technologies interact, there is a greater chance that they will collectively fail in some way or another. The normal approach to this conundrum is to integrate these systems through yet more technology - building energy management systems, for instance. The chances are that the cure is worse than the disease.

Open-plan offices, because they are deep in plan form, need more services to temper and cool the air and artificially light the spaces away from the windows. If they are not being properly managed, either through ignorance, lack of money or wilful neglect, then they are also much more likely to be more unpleasant for the occupants to work in.

Many performance failures can be explained this way, but it is not the whole story. Offices are also more complex spatially: there are more types of space in them and these are being used more intensively. The new language of office space planning - workspace (for people at their workstations), ancillary (added to workspace) and support (for the whole building) - is testimony to this change. More emphasis is being put on ancillary and support (meetings, receptions, quiet rooms, restaurants and social spaces) in addition to workspace requirements. Much more care is taken with space and its allocation - in some organizations office space is, loosely speaking, used as a kind of primitive currency because it is a rare commodity. Space planning guidelines are more commonly used to help mediate between managers' and designers' requirements in large organizations.

Spatial complexity overlaps with behavioural complexity. Office work is becoming more and more differentiated. Work tasks are becoming more specific and specialized. Understanding exact requirements is therefore more difficult, partly because the contexts

of these tasks are harder to define. There are more part-time staff, more people working from home, more people moving about, more visitors, greater demands on security. Behavioural, psychological and physiological topics like stress, health and motivation have all been added to functional and productivity requirements. The expectations that clients have of designers are higher than they used to be, and designers, like technologists, tend to promise too much and deliver too little.

KILL OR CURE?

Coping with the growing complexity is not easy. The basic way forward is better performance data and better briefing. Post-occupancy evaluation (POE) is one way of getting at building performance - by studying the outcomes of design projects and learning from the mistakes. This is quality control writ large. But POE has to be done rigorously and consistently across many buildings (which is expensive) to yield really useful knowledge.

Better briefing is another way forward. Briefs ought to draw on post-occupancy study data and tie down client requirements far more accurately than in the past.: most do not. A manageable brief will always question assumptions and promises like "flexibility" and "maintenance-free", and make sure that they are exactly defined within a clear design or performance context. The language used in the brief will be that of the organization and its managers, so everyone can understand it and subscribe to it, rather than using the languages of space planning or services engineering which are often unintelligible to managers.

Both POE and briefing are about understanding human needs better, so that designers and managers can respond more appropriately. How is this to be done? By improving the capacity to make design decisions, and understanding more clearly their management and social consequences. This is a way forward which is not caught up in a technological vicious circle (where technology is used to "solve" problems which themselves are created by its improper use). It gives as much emphasis to the negative consequences of change - the *constraints* and *bottlenecks* inherent in buildings and their use - as it does to the positive - *adaptability* and *flexibility.* People ignore the negative, and look only at the positive, but both are always present, and both must always be planned for.

Open plan, kill or cure? Kill it, if you do not have the management resources to run the open plan properly - go for shallow-depth, cellular offices with simpler services which are easier to maintain. Cure it, if you understand properly the management

consequences of the open plan: raise the profiles and capabilities of building managers; study the staff in more detail and understand their comfort requirements; clean the office properly; keep the energy consumption figures down; plan for how people actually behave (rather how managers feel they ought to behave); and think about how control and communication should work to support each other, rather than fight against each other as they do in most open plan offices in Britain.

Adrian Leaman is Managing Director of Building Use Studies.