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How and why to assess workplace design: Facilities management supports human resources

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Most organizations have a physical footprint, and someone in those organizations makes choices about the physical place with an expectation for the effects it will have. Some high-profile companies commission dramatic buildings from leading architects, such as the new Apple Park in Cupertino, California, designed by Lord Norman Foster, with the goal of creating a "wonderfully open environment for people to create, collaborate and work together". Even high-tech start-up companies with low budgets make considered choices about the work environments they provide, to attract employees, to encourage teamwork, and to send a message to customers and investors about their capacities to innovate. Business and design magazines alike publish glowing descriptions of these design features as the workplace opens, but very rarely do they feature long-term evidence about how well – or poorly – the design succeeded. This creates an information gap in which organizations remain unaware of the full benefits – or the hidden costs – of their capital and operating expenditures for spaces.

One reason for this may be historical. Every undergraduate psychology student has heard about the now ninety-year-old Hawthorne experiments, which famously observed that work output in an electrical manufacturing facility increased in response to increases in light level, decreases in light level, and replacement lamps that left the levels unchanged. Arguably, these findings led to the belief that lighting and other working conditions are irrelevant to job performance, and slowed down research into these effects for decades, whereas research into other aspects of management-employee relations has flourished. Similarly, Frederick Herzberg's Motivation-Hygiene theory (published in the 1950s) suggested that job satisfaction emerges from the work itself and job dissatisfaction develops in response to contextual influences, known as "hygiene factors". Herzberg believed that once the basic hygiene requirements are in place – enough light to see, space for materials, sufficient cleaning to prevent disease – working conditions ought not to matter very much to employee motivation.

One sense in which Herzberg was correct is that employees find fulfilment and pleasure in making progress towards meaningful goals. As psychologist Teresa Amabile has written, managers can help their employees best when they

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recognize employees for their progress towards getting things done. The feelings of success with small steps towards meaningful work promote the intrinsic interest in the work. Managers succeed when they can remove barriers that prevent progress, when they can enable employees to achieve what Csikszentmihalyi has called *flow*, a state of effortless attention and focus.

Since the 1980s, environmental psychologists and their colleagues in industrial—organizational psychology and schools of business have built a research foundation that shows how the physical conditions in workplaces can either stand in the way of flow, or can help it along. It builds on existing theories concerning work attitudes, particularly (1) the job demands-resources theory of stress and (2) positive affect theory, currently associated with the positive psychology movement. The physical reality of the workplace and employees' perception of it can either add to the demands of the job, or provide resources that enable great performance. When the demands are high, resources low, or the fit between person, job, and place is poor, stress happens and both individual and organization suffer. Conversely, the right conditions, or the ability to modify conditions so that they are the right conditions for that individual, elicit positive affect, which can lead to favourable outcomes for both individuals and organizations.

This seems logical, and perhaps well-known to some, but experience has shown our research group that institutional barriers can hinder its application. If the incentives for facilities managers focus on the capital and operating costs of physical places, the result is an incomplete analysis. As will be shown here, bringing together facilities management with human resources in a systematic way can help both to work better together to support the organization's goals.

Our starting point is the organizational outcomes that matter. Later sections address the influence of work environments in two well-known theories of workplace behaviours: the job demands-resources model and positive affect theory, followed by a discussion of how building certification schemes for sustainable buildings can also benefit employee well-being and organizational productivity. The closing sections describe a framework that brings all the evidence together.

PRODUCTIVITY DEFINED

According to the Oxford English Dictionary, *productivity* means "The effectiveness of productive effort, especially in industry, as measured in terms of the rate of output per unit of input". Colloquially we tend to think of productivity in straightforward industrial units that could be applied to individuals (e.g., number of garments sewn per shift; number of orders processed per hour). These units do not apply well to many contemporary organizations and occupations, where outputs differ from one to another more widely (e.g., one project report is not like another), and which often rely upon inputs from more than one individual. Both science and organizations have moved beyond seeking to know only which working conditions will lead to faster typing; we want to know whether the resulting document helps the organization to fulfil its mission. We will get farther by thinking about *organizational productivity* when considering how work environments help or hinder, rather than focusing solely on the individual level. Organizations succeed and fail based on the balance between output value and input costs, and the research shows that work environments influence both sides of the equation. Most of this paper will describe these effects.

Kaplan and Norton introduced the balanced scorecard as a way to assess managerial or organizational performance using multiple metrics. Among these are traditional financial indicators, to which operational measures add depth. One strength of this approach is the ability for organizations to tailor the specific metrics to a set reflective of their mission and goals. This same approach can be adapted to monitor the effects of buildings by including ongoing monitoring of building conditions and sustainability metrics (e.g., energy use or greenhouse gas emissions) together with employee-based metrics such as absenteeism, retention, job satisfaction, thermal comfort, self- or manager-assessed performance, and so on. My colleagues Alexandra Thompson, Guy Newsham, and I proposed this approach as a way to value the energy, environmental, individual and organizational benefits of building automation systems, which offer the promise of improved efficiencies (reduced energy use, simplified system maintenance), but which can be costly to install and complex to operate. Monitoring the scorecard metrics on a regular basis provides a way to identify weaknesses that should be remedied and the information needed to demonstrate the value of the system in a monetary sense.

Fig. 1 shows an example of what such a scorecard might look like in relation to work environments, although organizations can set their own list of metrics to include and target values for each. Note that it combines values for the building itself and those related to the experience of the people in the building. Extensive guidance exists (e.g., in building regulations, codes, and standards and in voluntary certification schemes) to assist organizations to understand the relevant industry norms and to set their own target values for the building characteristics. The frequency of reporting is customizable, as is the unit base for reporting. For example, an organization with many buildings might report each building; alternatively, one might subdivide by floor, according to the specific design features, by organizational unit, or by job characteristics. Reporting following major environmental change is an obvious application allowing the organization to track the effects of the change. Although we are not the first group to propose this approach to incorporating the built environment into organizational reporting (the first example we have seen was in 2003), there seems as yet to be few adherents to it. (An exception to this is the WELL Building Standard, discussed below.)

Organizations see both capital and operating costs in their budgets related to providing a place to work. These can add to substantial amounts, making them a target for cost savings. It is important to keep in mind that for most organizations, especially those in the knowledge and service sectors, labour costs are far greater than facilities. A commonly cited ratio is \$300/ft^2 for payroll, \$30/ft^2 for space (building and furnishings), and \$3/ft^2 for utilities. The wrong choice of space or equipment to save on the cost side of the organizational productivity ratio, if it adversely affects employees, can quickly cost more than it saved. Conversely, by making choices that support employees, it is possible to improve

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