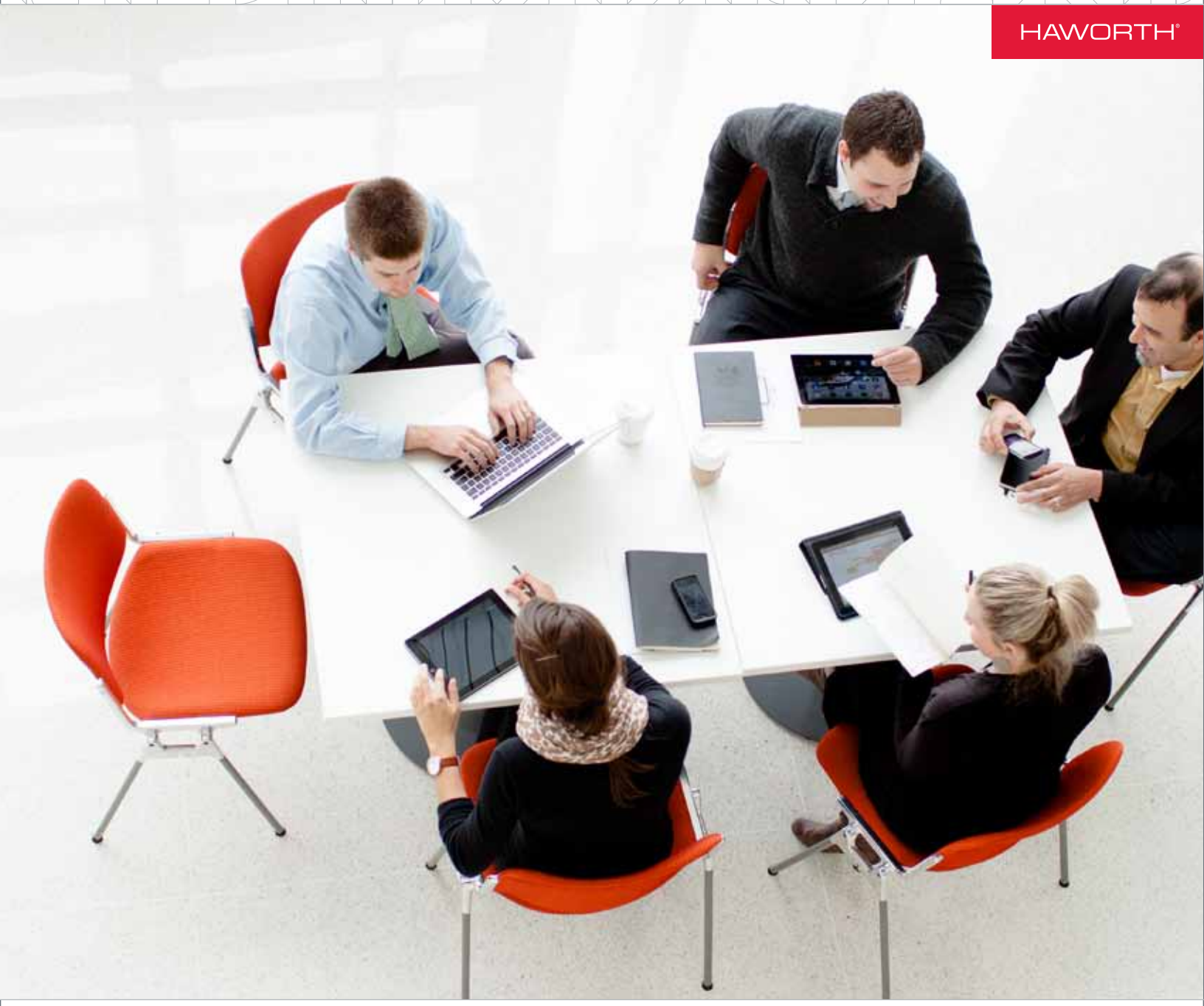
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Office Environments to Support Future Organizations

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The great number of influences impinging on office design, including economic conditions, architectural and design trends, new products, client objectives, standards, and regulations, makes predicting the office of the future extremely risky. One must transcend the temptation to merely critique current practice or prescribe design solutions in search of a problem in order to capture and integrate the relevant societal, technological, and organizational trends.

A Brief History of Office Trends

As the saying goes, to understand where you're going, you must understand where you've been. Historians have variously linked the development of modern offices with the railroad industry, stock trading, insurance and finance, or government. Railroads had an impact, for example, as clerks became necessary for processing contracts governing the distribution of goods by rail. These early offices tended to be vast rooms containing row after row of free-standing desks, with only a few private offices for a sparse management layer. Thus, status-based distinctions concerning privacy and space accompanied the earliest instances of corporate offices. As more and more service industries grew to support this vast rail network and supplement the growing manufacturing sector, more managers needing office space joined the workforce.

Essentially, only four developments have significantly altered these earliest office environments from the occupants' perspective:

1. The invention of the elevator
2. The first evolution of the open-plan office, known as the Bürolandshaft (or office landscape) movement, which began in the 1950s in Germany
3. Bob Propst's concept of an office supporting changing work conditions with modular components, circa 1960s, designed to increase productivity, provide individual space, and increase privacy—the cubicle is a pared-down version of this view of the office
4. Ergonomic developments

The elevator and advances in building materials allowed the development of skyscrapers, and the landscaped office concept addressed most of the concerns behind the current green movement. Unfortunately, the landscaped and modular-component approaches to offices were almost immediately corrupted to support technology and save space. In large measure, the white-collar factory metaphor for offices remains with us into the 21st century. Even the otherwise useful discipline of ergonomics has retained a "machine metaphor" for assessing office occupants, although its subfields of macroergonomics and hedonomics have provided helpful, broader perspectives (Brand, 2008).

Competing Constituencies

Architects and designers desire to be creative and innovative. Corporate clients are interested in a productive, satisfied workforce. CFOs, CRE and facility managers, and shareholders focus on the need for real estate savings. All of these compete to determine the outcome of corporate office projects. Until recently, economic real estate metrics have invariably won out, and the solutions offered by cubicles have placated corporate clients' productivity requirements (Miller, Strombom, Iammarino and Black, 2009). However, in spite of the recent economic downturn, recruitment and retention remains a concern, and corporations planning for the future have begun to explore job satisfaction issues in earnest—along with their economic implications.

The struggle among interested constituencies in corporate office projects frequently revolves around what each of them accepts as evidence of success. CFOs can easily demonstrate the value of their proposals to increase density and eliminate design enhancements because almost everyone in the transaction accepts a business case for decisions. However, in simple terms, profit is the ratio of income to overhead, so an increase in income can maximize profit just as effectively as a decrease in costs.

Still, very few hard numbers exist for strategically pursuing knowledge worker productivity through design, so cost-cutting strategies often prevail.

What's more, there is a scarcity of evidence that specific products or environments are necessary for new ways of working to emerge, or that the new ways represent any improvement over the old ones. Only prospective, predictive studies with suitable control groups can provide evidence for any unique value to occupants. Until such knowledge exists, designers and vendors have been free to make claims regarding productivity and other enhancements following the adoption of certain products or services.

Current Organizational Trends

Although more research investigating the impact of office design on individual occupants is needed, some broad, qualitative generalizations at the organizational and macroeconomic levels can be made. Based on secondary research of a convenience sample of high tech executives (N = 10) and a representative sample of facilities executives (N = 100), we have uncovered some underlying dimensions of change that currently impact corporations. We believe that these change continua will continue to be relevant into the foreseeable future. Although change along these dimensions broadly conceived seems to be uniform, no doubt individual organizations will find themselves at various points along each continuum.

Changing Corporate Strategies

Internal to External Focus: Up until quite recently, internal considerations such as core competencies, personnel, suppliers, products and services, distribution, process engineering, and other outside-in factors could be focused on to improve the business. Increasingly, external considerations such as market share, customer needs and behavior, societal and cultural trends, generational trends, and other inside-out factors figure prominently in strategies that position organizations for future success. Almost any technique that can reduce the cycle time to understanding customer issues and meeting their needs with timely new products and services will be a great investment to make. Corporations of the future will keep their businesses current by maintaining an external, inside-out focus.

Process to Trends Orientation: Echoing the general inside-out theme, corporations of the future will need to do more than just design, implement, and monitor efficient internal processes and their interactions. They will also need to anticipate, understand, and address the broader societal trends that influence their customers and their customers' perceived needs and desires, positioning their products and services to take advantage of this advance knowledge.

Fixed to Flexible Strategic Planning: The once vaunted IBM has managed to reinvent itself several times from designing and building mainframe computer hardware to PCs to providing e-commerce applications and consulting services. In so doing it has scrapped fixed strategic plans that make rigid assumptions about revenue streams and market share. In fact, their horizon for a relatively permanent strategic plan reaches only two years ahead. Beyond that, they remain flexible by generating responses to a number of alternative scenarios. Owens-Corning's move to fiber optics represents another example of this broader shift from fixed strategies based on linear extrapolation of current trends to the nimble embrace of change and the flexibility to meet unpredictable opportunities as they arise.

Executive to Customer-driven: Since speed of response (in acquiring customer intelligence, product design and development, product shipping, customer service, and many other areas) represents a primary competitive factor—and no doubt will remain so—whatever can be done to decrease such cycle times will improve business prospects. Future organizations will figure out how to outsource their strategic planning to their current and future customers. Many retail companies now collect customer knowledge at the point of sale, and this information immediately informs supply chains and distribution channels without the cumbersome need for executive oversight. Regardless of how gifted the executive team, if they're interpreting and responding to information filtering up and down a hierarchy, their company will not match the pace of competitors. A market research > executive decision > company response chain can never be as short as a customer response chain. Dell Computer reflects this customers-as-strategic-planners approach, and although they have been affected along with the entire sector by recent tech stock slumps, many investment firms again include them in their buy column.

Corporate Culture to Society: We still don't know nearly enough about corporate culture—exactly how it arises, how to influence it consistently, or precisely how it relates to corporate success. However, savvy businesses have already supplemented considerations of their own corporate culture with investigations of the cultural trends within the broader society (e.g., sustainability). This is particularly true of global multinationals that must respond to a number of different cultural imperatives to ensure their continued growth and success.

Physical to Mental Environment: Corporate executives, facilities managers, and designers have all begun to recognize the impact of the physical environment on the mental functioning and capabilities of employees. We can no longer afford to evaluate design and building performance issues independently of the preferences, responses, and needs of occupants. Organizations of the future will manage design projects in terms of occupant-centered definitions for both problems

and their solutions. While customers will drive the front end of these businesses, employees will drive the back end, and both constituencies will be accepted as critical for long-term survival.

Changing Organizational Structures

Status to Performance Based: Not "How long have you been here?" but "What have you done for me lately?" will determine space and resource allocation standards for companies of the future. However, the human resource implications of paying such ruthless attention to creative, innovative productivity will figure just as prominently—if not more so—in any successful transition to performance-based standards for space, resources, incentives, and promotions. The nature and relative success of change management strategies will largely determine whether this procedural shift spells success or disaster for first movers.

Hierarchical to Strategic/Flat: Many have highlighted the increasing shift from the military-inspired, command-and-control organizational structures to the flexible, flat structures of today and tomorrow. This change parallels the gradual shift from products to services within historically manufacturing companies such as GE or 3M—both of which have managed to remain competitive in today's unforgiving business climate. (While these two organizations have completed the switch from hierarchies to flat structures, they have been increasingly influenced by this general trend.) After all, a layer of managers thinking and making decisions and at least one additional layer of employees carrying out those decisions costs more than one layer of employees thinking and making good decisions—not to mention the difference in cycle times.

Top-down to Local Control: Although similar to the last continuum, this trend to move decision-making and resource-allocation down to lower levels in the hierarchy has been important even within organizations who have retained an otherwise rigid, hierarchical structure. Increased speed of response represents a primary advantage of this change, along with ensuring that empowerment for making critical decisions remains closer to customers—allowing them to have a timely impact on internal processes and initiatives.

Organizational Chart to Functional Alignments: Also reflecting the shift from rigid, fixed strategies to fluid, dynamic arrangements, this trend allows companies to change focus and direction much more quickly than the hierarchies of the past would allow. This change continuum has a number of salient office design implications, since the important behaviors and interactions that must be supported and leveraged within corporate office environments cannot be understood simply by studying the official organizational chart. Ideally, programming approaches include observational and other indirect methods of understanding exactly where to draw the line between relatively unchanging business sectors and the dynamic recombination of other teams and processes.

Departmental Silos to Integrated Solutions: This represents the need to develop new metrics for ROI and ROA evaluations that relate traditionally separate areas of operations. For example, if facilities management claims to have saved $1.5 million by increasing density 35%, but employee turnover has increased 10% as a result—representing costs for recruiting and training replacements or relocating and retraining other employees of $5 million—overall, the company has lost $3.5 million.

Office Facilities as Overhead to Strategic Investment and Incentive: Regardless of the recent economic downturn, recruitment and retention of highly productive employees will remain important and difficult for most corporations for at least the next five to ten years. There are at least 30 million fewer Gen-Xers than Baby Boomers to replenish the workforce in the world's largest economy—America—although China and India are closing the gap.

The Changing Nature of Work

Independent to Collaborative: Although several researchers have noted that at least in the United States, about 60% of office workers still spend approximately 60% of their time working alone, there has been a gradual, steady shift away from independent, heads-down work to more collaborative, team-based activities—even in conservative sectors such as banking and finance. Generational differences and changes in the delivery of educational services that supply the workforce have contributed to this trend, and it appears it will continue into the foreseeable future.

Management-directed to Self Directed: As corporate strategies embrace flexibility and hierarchies crumble, individual workers become more responsible for their own contributions—from start to finish. According to the late management guru, Peter Drucker, leveraging this knowledge work represents the most important challenge facing organizations of the future. Meeting this challenge requires an integrated approach that includes adjustable, movable, reconfigurable, yet dedicated environments, as well as performance-based incentive structures, group-level rewards and performance evaluations, and adaptable perks such as flextime and ubiquitous access to technology.

People as Interchangeable Parts to Critically Unique: When workers simply implemented processes planned by others, their function for the organization involved only their brawn. As job descriptions widen and the variety of responsibilities that each job entails increases, workers' brains increasingly determine their effectiveness. The unique social network and other tacit knowledge acquired by each employee during their tenure represent advantages that sagacious corporations crave and exploit. The most conservative estimates of the costs to replace one employee start at 1.5 times his or her salary.

Repetitive (Efficiency = Speed and Accuracy) to Creative: Repetitive work ruled in the past, with speed and accuracy for the most part representing

productivity. However, the quality of ideas rather than the quantity of activity has become the new path to success.

Observable/Measurable to Serendipitous/Abstract: Repetitive work can be easily observed and measured, while creative innovation rarely corresponds in any meaningful way to a unit of time. What's more, the source of important creativity less and less frequently reflects the isolated contributions of single employees. The best ideas integrate several levels of abstraction within the corporation and cut across various sectors and processes. Thus, they are almost impossible to attribute to a single individual.

Process Support to Knowledge Work: To reiterate many of the points made above, office environments to support future organizations must nurture knowledge work rather than large groups of workers simply implementing the processes designed by management. And since factors external to the organization now provide the most meaningful insights to determine its future course, anticipating and designing the ideal environment to support these workers will become increasingly difficult. Flexible, adaptable office designs featuring seamless technology integration can minimize the cost and disruption of change and transition. Investments such as raised flooring, easily moved wall dividers and partitions, and adaptable, reconfigurable technology access and support will become commonplace.

Place- and Time-based to Outcomes/ Results-based: Work will increasingly occur to support projects and other well-defined, outcomes-based initiatives. Space and technology will be designed with this geographic and temporal mobility in mind. Although it's difficult to document broad trends in this area, it would seem that in the future, flexible, technology-enabled office space will be located more conveniently for workers—rather than within single-company monuments.

Offices of the Future

Generational Influences

A number of recent management books have outlined the essential distinctions among the Veteran, Baby-Boomer, Gen-X, and Gen-Next cohorts of workers. Since a lag time of approximately 30 years separates the peak changes associated with each of these generations, most corporations focusing on quarterly profits don't have the luxury of responding to this level of change. However, organizations planning for long-term viability must anticipate inevitable clashes among these generations, as for individual companies, the practical importance of resolving these disputes overshadows the impact of the wider trends linked with the passage of one generation to the next. Certainly there are broad, important differences between the generally more mature Veterans and Baby Boomers on one hand and the younger generations of workers on the other. These include younger workers' preferences for consensus decision-making, individual autonomy, and personal control over work-life balance, and managers serving as mentors and coaches rather than as supervisors. Younger generations have also embraced green design as the new normal, so expect ubiquitous sustainability considerations.

Legislative/Regulatory Externals

Even though former President Bush's administration rescinded OSHA's Ergonomics legislation, government standards and regulations will continue to have an important role in shaping office environments and work styles of the future. Appropriations for road construction, zoning restrictions, environmental protections such as air quality standards or carbon credit/ trading programs, and both direct and indirect incentives for mobile/telework programs or public transportation can all have an important influence on the location, size, and design of corporate office facilities.

Technological Developments

Obviously, technological advances cannot be ignored when predicting the future of corporate office environments. Technology will soon support the transaction of business in virtual environments on virtual documents with perhaps even some virtual participants. Wearable, wireless technologies might allow meetings among geographically displaced workers who can asynchronously participate in virtual conferences interspersed with more interesting and individually suited activities. However, just because technology is available to support some futuristic vision of working does not mean it will inevitably be accepted and used by everyone.

Psychosocial Context

People are social animals, and the pace of change in their tastes and preferences regarding social interaction does not match that of technology or the marketplace. Therefore, companies who eschew co-location and the biologically and culturally determined advantages of face-to-face communication in order to prematurely embrace the technologies of virtual work environments may continue to be disappointed. Although the superior technological

sophistication of Gen-Xers compared to Boomers—and of Gen-Yers compared to Gen-Xers—is undisputed, the replacement of actual locations for corporate office environments by virtual work alternatives violates too many psychological imperatives to seem viable into the foreseeable future. Nonetheless, currently available technologies such as HP's Halo virtual presence system and Cisco's Telepresence have begun to bridge the gap between the advantages of face-to-face interaction and what technology can provide and support.

A Promising Direction

With input from the New Ways of Working Network (NewWOW), Orfield Laboratories, Inc., and the National Research Council of Canada, Haworth's research and design team optimizes open-plan offices by defining design problems and solutions in terms of occupants' experience of the space. Along with these and other partnerships, Haworth has developed a number of unique approaches to pre-planning and schematic design that have generally improved accepted practice. A few of these techniques are described below.

Perceptual Response Programming (PRP)

Because most workers do not consciously understand how the physical environment influences them, traditional programming techniques such as interviews and focus groups or design charettes can fail to distinguish between subtle yet important design differences. Furthermore, quantitative measurement of individuals has been superior to qualitative measurement of groups for predicting actual behavior, so indirect, quantitative measurement of occupants' immediate experience represents an ideal approach.

Visual Quality Programming and Perceptual Market Research are similar techniques that capture these considerations and may be more familiar to architects and designers. Quality Programming and Perceptual Market Research are similar techniques that capture these considerations and may be more familiar to architects and designers.

Combining Subjective with Objective Measurement

In addition to Haworth's own research, other evaluations have documented some of the problems with many current open-plan office installations. These problems are rarely strictly product-centered, but usually involve occupants' overall experience of the space over time. Therefore, defining design problems and solutions must include objective assessment of the psychologically meaningful dimensions of the environment, such as acoustics, lighting, day-lighting, thermal conditions, aesthetics, human factors and ergonomics, and group identity, as well as subjective assessment of occupants' preferences and responses to various alternatives differing along these dimensions.

In brief, the approach features occupant-centered design, but in the broadest sense—including organizational culture and new styles of working. Behavioral criteria inform building performance criteria to demonstrate the experiential value of designs before and after installation. Success can be defined quantitatively in terms of objective criteria and the subjective experience of occupants. This process can determine the value of design investment—a persistent challenge for approaches that do not define success directly in terms of occupants. Defining design problems and goals in terms of occupants allows clear comparisons among alternatives in objective and subjective terms. Organizations of the future will provide proper environmental support for knowledge workers and occupant-centered design can ensure they reach that elusive goal.

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