

The strategic workplace: development and evaluation

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The US General Services Administration initiated a new programme that aims to understand better the linkages between the workplace and organizational effectiveness. This programme was motivated by the desire to bring the federal workplace into better alignment with the technological, organizational and demographic shifts that characterize work today. The process and methodologies in pilot projects are used to develop a workplace that more effectively supports the client organization's business goals and needs than current workspaces. The research approach studies these sites pre- and post-occupancy to identify the extent to which desired outcomes have been achieved. The research approach uses the Balanced Scorecard as a framework for developing goals, hypotheses and metrics for each project.

Keywords: asset management, building performance, business outcomes, design quality, organizational effectiveness, project delivery, property management, quality control, workplace effectiveness

L'Administration américaine des services généraux a lancé un nouveau programme dont l'objectif est de mieux comprendre les articulations qui existent entre le lieu de travail et l'efficacité organisationnelle. Ce programme a pour origine la volonté de mieux adapter le lieu de travail fédéral aux changements technologiques, organisationnels et démographiques qui marquent aujourd'hui le monde du travail. Les processus et les méthodologies des projets pilotes servent à concevoir un lieu de travail qui corresponde mieux aux besoins et aux objectifs de développement de l'organisation du client que son lieu de travail actuel. La méthodologie de la recherche étudie ces sites avant et après l'emménagement afin de définir la mesure dans laquelle les objectifs visés ont été atteints. L'approche 'recherche' utilise le tableau de bord équilibré comme cadre de développement des objectifs, des hypothèses et de la métrique de chaque projet.

Mots clés: gestion des actifs, performances des bâtiments, résultats du développement, qualité de la conception, efficacité organisationnelle, exécution du projet, gestion des propriétés, contrôle de qualité, efficacité du lieu de travail

Introduction

Organizations, work practices and the workforce have changed dramatically in the past 25 years due to technological advances, demographic shifts and continual demands for innovation in both the product and service sectors. Yet, if one were to walk through most federal workplaces in the US, one would think nothing has changed. Today's workplace is the

workplace of yesteryear. In many ways, the US federal government's workplaces are a microcosm of the larger population. They include a full range of office-related work from research and development to accounting and art conservation.

The US General Services Administration (GSA) aims to bring the federal workplace into better alignment with

these shifts in organizational life, demographics and ways of working. In doing so, it hopes to demonstrate how the workplace can be used effectively to influence organizational business goals and overall success. The idea that the workplace can be a strategic tool has been voiced by others (Becker and Steele, 1995; Duffy, 1997; Horgen *et al.*, 1999). However, there is little evidence that this is true beyond a few case studies. Nor is there any viable knowledge of how such a linkage occurs and whether successes in one context can be replicated in others.

How does the GSA intend to accomplish this goal? The WorkPlace 20-20 programme, established in 2002, is currently testing federal workplaces that have been developed by integrated teams of strategic consultants, organizational scientists, designers and researchers. Although the clients and contexts vary, the teams work from a common approach. They derive design concepts and solutions from a grounded understanding of the organization, its goals, its current and desired work practices, and the current and emerging work styles of its employees. Each of the current workplace projects is being tested pre and post on a wide array of outcomes developed around the Balanced Scorecard (BSC) (Kaplan and Norton, 1996). The BSC framework is widely accepted in the business world as a method to evaluate an organization's overall success across four domains: financial, business practices, human capital and customer satisfaction.

The purpose of this paper is to describe how WorkPlace 20-20 is expanding knowledge of the links between physical space and organizational effectiveness. It also discusses why the GSA is engaged in a programme of research about these links. The paper describes the overall process in more detail, including how early projects informed use of the linked mechanism methodology (Wyon, 1966) to guide research hypothesis development and selection of measures. It also discusses the overall evaluation programme and its link to traditional and emerging uses of post-occupancy evaluation (Cooper, 2001).

Workplace-organizational effectiveness link

To designers and workplace consultants, the physical environment looms large as a contributor to work life and organizational success. However, from the perspective of those in the organizational sciences, the physical features of the workplace are largely invisible (Heerwagen *et al.*, 1985). In the 20 years that have passed since the study by Heerwagen *et al.* of workplace contributions to employee performance, little has changed.

Why is the physical workplace invisible to organizational psychologists and management specialists?

Why has so much emphasis been placed on people and their behaviour and so little attention paid to place as a platform for behaviour? A review of organizational theory and research suggests three potential influences: (1) a strong perceptual bias favouring the social environment; (2) the legacy of the Hawthorne experiments; and (3) the view of the physical environment as a low-level need or hygiene factor. Another contributing influence to the lack of knowledge about the links between workplace and organizational effectiveness is the real-estate (property) profession itself, which sees success largely in financial terms (e.g. cost per square foot) and not in organizational terms.

Perceptual bias

The focus on the social environment at work may result in part from a bias in human perceptions of situations (Mitchell, 1978; Heerwagen *et al.*, 1985). As observers of situations and activities, our attention focuses primarily on other people in the setting, not on the physical features and attributes of space. One might notice the colours, patterns, furnishings and lighting, but eventually attention shifts to what people in the space are doing. As observers, we are highly motivated to understand others' behaviours and intentions and to 'calculate' the potential consequences for our own circumstances (Barkow *et al.*, 1992; Pinker, 1997; Lawrence and Nohria, 2002). Is this a friend or foe? Will he or she support me or undermine my plans? Can I trust him with a secret? Will she reciprocate if I need help? These kinds of questions have dominated social life across our evolutionary history. They are not new to the workplace.

The legacy of Hawthorne

In the late 1920s, Elton Mayo initiated a series of experiments at the Hawthorne Plant of the Western Electric Company to test the effects of various work changes on productivity (Mitchell, 1978). The first experiment looked at the relationship between illumination levels and work output. The study subjects were a small group of women who made telephone assemblies. To conduct the experiment, they were separated from their colleagues and tested in a small room where the lighting levels could be manipulated. The results showed that productivity improved regardless of whether the light level was excessively high or barely sufficient for work. This has been interpreted to mean that the environment has little effect on work output and that human factors are far more important. According to Mitchell (1978) the key human factors relevant to the Hawthorne experiments were working in a small group versus a large bullpen, receiving feedback on performance, receiving more attention than colleagues, doing something novel, and being interested in the experiment. The last three

factors are referred to as the 'Hawthorne Effect' and have to do with subjects' awareness of being tested and their desire to please the investigator.

Although the Hawthorne legacy is interpreted to mean the environment is not important to performance, one can also interpret it in the opposite way. By conducting the experiments in a small room that allowed a high awareness of what others were doing, this may well have contributed to performance improvements through social facilitation, tacit learning, improved communication, a sense of camaraderie and being observed more readily by managers. The fact that the spatial environment may have strongly influenced the performance results is remarkably overlooked in tales of the Hawthorne experiments.

Physical environment as a hygiene factor versus a motivator

Organizational psychologists have long been interested in motivation because it is a key factor in work performance (Mitchell, 1997). Motivation is defined by Robbins (2001, p. 155) as 'the processes that account for an individual's intensity, direction, and persistence of effort toward attaining a goal'.

Early theories of work motivation focused on satisfaction of human needs. Maslow's (1954) hierarchy of needs has been one of the most influential. The theory has two key concepts: (1) needs are motivators of behaviour, but only when they are unfulfilled; and (2) higher level needs are more successful motivators than low-level needs. The physical environment enters into Maslow's theory as the lowest-level motivators: the needs for physiological support and safety. The other needs in Maslow's hierarchy are social and psychological: the needs for belonging, esteem and fulfilment of one's potential (self-actualization).

A similar theory proposed by Herzberg *et al.* (1959) distinguishes between 'hygiene' factors and 'motivators'. Working conditions fall into the hygiene category. Herzberg *et al.* argued that the hygiene factors could only be dissatisfiers, not motivators, of behaviour. That is, the physical working conditions are largely neutral in their effect and are influential only when viewed as inadequate. Later theorists focus even more exclusively on how the social environment, including human relations and managerial policies, influenced the fulfilment of needs for achievement, power and affiliation (McClelland, 1961) or needs for existence, relatedness and growth (Alderfer, 1969).

Corporate measurement of real-estate assets

Organizational scientists are not alone in their lack of attention to the organizational value of the workplace. The real estate (property) profession itself has blinders. While it may be too strong to call it a bias, the typical

corporate real estate (property) management contains within its approach to real estate (property) assets a viewpoint that is perhaps more pervasive and inimical to developing an understanding of the value of the physical environment in influencing organizations' performance. A survey in 1995 by the US General Services Administration of corporate measures of real estate performance identified eleven commonly used measures; of these only one (tenant satisfaction) was linked to the use of the asset by an individual or organization (Huber *et al.*, 1995). A benchmarking study of 22 real estate portfolio managers in 1997 identified a similar suite of measures. Again, there was no measure that linked the use of the real estate asset to the performance of the people or organizations using the asset (Kampschroer *et al.*, 1997). There was not even a sentence about the topic. Bon *et al.* (1995) argued for a stronger link between the measurement of corporate real estate (property) management and organizational performance. However, it was expressed in purely financial terms, such as cost per square foot or per person. In this, one also finds mention of a placeholder for tenant satisfaction: the number of calls to the helpdesk per square foot.

In their forecast for the management of corporate real estate assets in 1999, the IDRC (1999) identified not one measure that was premised on a link between the environment and the occupying organization's performance. In a recent update to this forecast, 'CRE2010', CoreNet (a large network of corporate real estate/property managers). identified trends in eight areas, and only in one, 'The Changing Nature of Work and the Workplace', was linkage addressed (CoreNet, 2004). The consistent emphasis for the major owners of real estate/property, where the real estate/property is owned in order to conduct the work of the organization, is cost reduction. Yet several have shown that the cost of real estate/property when compared with the total costs of knowledge work is less than 10% (Loftness, based on US Department of Labor Statistics data, 1999).

The lack of measures that are either widely accepted by business managers or at least demonstrated to have financial validity reinforces the construct that real estate/property is an item of overhead, and like all overheads, presents most saliently an opportunity for its own elimination.

Despite the fact that organizational scientists pay little heed to the physical environment, there is good evidence that space influences many social behaviours and processes of value to organizations, such as collaboration and communication (Cachere *et al.*, 2003; Heerwagen *et al.*, 2004; Teasley *et al.*, 2000), work flow (Nandhakumar, 2002), and the coordination of activities (Horgen *et al.*, 1999). Environmental factors also influence attention, memory and other

cognitive processes that underlie individual work effectiveness (Kirsh, 2000; Heerwagen *et al.* in press).

The research findings, however, usually do not get beyond the scholarly journals and into the workplace design, in large part because researchers are more interested in developing theory and basic principles rather than application (Cooper, 2001). Even when research finds its way into the work setting, the results can be disastrous if findings and concepts are applied without regard to the organizational context (Heerwagen *et al.*, 2004). Such was the case when Chiat-Day, an advertising firm in the US, created a non-territorial workplace for its New York and Los Angeles offices based on findings from a study by Allen and Gertsberger (1973). The study showed improvements in communications among a small group of research and development scientists who moved from a traditional office environment to a totally open space with a variety of work areas, but no individually assigned workstations. When Chiat-Day adopted the same concepts for its two offices, the experiment resulted in high employee dissatisfaction and eventual return to a traditional space. Although there are many explanations about why the experiment failed, it is argued here that ignoring the organizational context was a key determinant.

The Workplace 20 · 20 Approach

Why is GSA doing this?

The Public Buildings Service (PBS) of the US General Services Administration is a real estate entity within the US government whose customers are predominantly other government organizations. The PBS is the largest owner, operator and user of office space in the country. Its fundamental mission is to assist other federal agencies in achieving their missions by providing real estate/property-related products and services. Succinctly stated, its mission is to provide superior workplaces for the federal worker while providing superior value to the US taxpayer. The following excerpt from the Annual Report for 2000 describes the current PBS:

With a portfolio of almost 334 million square feet (31.8 million square meters), the GSA Public Buildings Service is the largest public real estate organization in the United States. PBS provides workspace and related services in over 8,300 leased and owned facilities that house more than one million Federal workers in 1,600 communities across the country. . . . With 40 percent of the market share for Federal office space, we operate like a business and compete in the marketplace to keep our customers

Over 8000 individual buildings in its inventory generate revenue of US\$7.8 billion, and typically

US\$500 million to US\$700 million net income (USGSA, 2000–2004).

While the PBS is a very business-like entity, with clear business goals, measures, a balance sheet with revenue and net income, it is also a part of the sovereign government. In the latter role, it has several objectives that transcend business and address the welfare of US society as a whole (Moravec, 2002). One example of this is the policy, in place since the mid-1950s, to place governmental activities in urban centres. This is based on the understanding that cities are inherently valuable for the US, and the slight marginal increase in cost that sometimes, although not always by any means, accompanies such decisions is an appropriate use of taxpayers' money.

To understand how and why PBS made this decision, one must first set the stage with a brief history of the PBS, and its changing policy direction.

The PBS was created in 1949 because of a desire to effect greater efficiencies in the government by centralizing procurement and real estate functions (US Congress, 1949). From 1949 to 1972, the way the organization functioned was relatively stable. Most of the work was performed by government employees. The government owned the majority of the real estate occupied by the civilian government. Leasing space was one of the functions of the PBS, but was viewed as a short-term expedient.

While there was one major shift in the fundamental policies in the first 50 years of GSA's history in 1972, it was not until 1995 that the rate of change accelerated dramatically. From 1995 to 2003, three major events triggered the current understanding that research, coupled with the delivery of new products and services derived from that research, would be one of the keys for the future success on the PBS:

- a proposal to abolish the GSA as a provider of real property
- establishment of financial discipline in the management of real property assets
- inability of improved financial performance to yield improved performance *from occupants' point of view*.

In 1972, the US Congress, with the Public Buildings Amendments of 1972 (40 USC sec. 491, *et seq.*), required the PBS to set prices for the space it provided. The prices were to be equivalent to what a commercial enterprise would charge for the same space. This ought to have had a profound affect on the relationship between the PBS and its customers, because the tenants of buildings now began to pay the cost. It did

not. Ironically, it took the mounting federal deficit and the drive to balance the budget to enable agencies to understand fully the value of this financial change. In the mid-1990s, many federal agencies began to realize that the cost of space was an item in the budget that should be considered along with other sources of funding. With the pressure to balance the budget, all aspects of expenditure began to take part in the total equation about how, and by what means, an organization accomplished its mission. Under these constrained circumstances, agencies began to demand that the PBS deliver space and services efficiently, and in a way that assisted the agencies in achieving their mission.

The increasing demand for efficient space and services that effectively supported agency (i.e. the building tenants') mission coincided with the initiative to create 'a government that works better and costs less' (Gore *et al.*, 1994, title page). In the report outlining the initiative's goals, an early draft called for the complete abolition of the GSA. The principal criticisms were that it was unresponsive, failed to consider customer service and failed to achieve adequate financial management of the assets entrusted to its care. Fear of annihilation is a remarkable motivation for change, and the PBS did change dramatically.

From 1994 to 1997, the PBS created the discipline of real estate portfolio and asset management; it also established new processes to create and use asset business plans for all its assets, owned or leased, created a completely new policy for setting the costs of its services that divested much financial decision-making from the PBS to its customers, eliminated its monopoly on the provision of space and services, and established an entirely new system of performance measurement and compensatory reward (Berger *et al.*, 1998).

Yet this financial discipline did not improve the perception of PBS's customers about PBS's performance or value. A series of surveys, begun in 2001, showed that at the senior levels of the governmental organizations, the PBS was perceived as being relatively weak in supporting the functions, activities and missions of the organizations using PBS buildings. Consequently, in successive strategic plans, the PBS sought to discover ways to create workplaces that would enhance its customers' fundamental performance. In doing so, it used much of the literature survey and evaluation conducted by Loftness and others at Carnegie Mellon University. However, in a set of pilot projects, the results showed that even though the research was available, presented as a part of the design brief, and its use desired by the client, nonetheless the practitioners in construction and design were unable to create an integrated result that conformed to the needs of the occupants' work

activities (Loftness *et al.*, 2001; Kampschroer *et al.*, 2004). These projects, which were viewed as successful but limited, led to the commissioning of the research programme described in the present paper. Perhaps more saliently, it was the recognition that translating research, either new or extant, into changed business practices would require more than an application of the principles of building performance evaluation, where the evaluation of the past informs future projects (Preiser *et al.*, 2005). It would, at least for the PBS, require that the entire process be reconceived from the viewpoint of organizational performance. The potential for the creation of new value by doing so is now incorporated into the PBS's strategy.

Overall Workplace 20·20 process

WorkPlace 20·20 is a process and methodology for linking workplace-making to organizational business goals and strategy. Key components are organizational analysis, design concept development, design development and implementation, and project evaluation.

Organizational context analysis

Context analysis identifies the organization's mission, structure, decision-making policies, values, cultural norms, risk-taking tendencies, customer/stakeholder relationships, and internal and external business challenges. Understanding these factors is important not only for the development of workplace concepts that support business goals, but also because deeply embedded views can influence an organization's overall approach to facilities. For instance, O'Mara (1989) shows that organizations with a 'rational-instrumental' problem-solving perspective tend to emphasize functionality, cost and standardization in facilities. In contrast, those with a 'valuation-symbolic' perspective emphasize culture, image and values. These high-level problem-solving approaches affect all subsequent design decisions.

Through a series of exercises and meetings, the information gathered during the organizational context assessment is translated into insights about the organization itself, and then into design issues and concepts once the issues are fully understood. The analysis is done by a multidisciplinary team including workplace strategists, organizational scientists and designers.

An initial visioning session and synthesis of information is organized around the BSC organizational measurement system (Kaplan and Norton, 1996). The BSC then forms the basis for three facets of the project: (1) the rationale for linking physical space to organizational goals; (2) a means for the organization to discriminate among alternative designs; and (3) the measurement strategy. Once this wealth of organizational experiences is condensed and analysed, the

team works with the client to explore the implications of the findings for workplace development. The primary concern of this interaction is to identify key themes or ideas that become the organizing framework of the design exploration.

Design concept development: design development and implementation

Information from the organizational analysis is fed forward into a concept charette, modelled on the traditional design charette. The charette team includes those who conducted the organizational analysis as well as participants from the client and the GSA. Members of the research teams also take part to provide knowledge about existing research findings relevant to the workplace design, including acoustics, collaborative work, social networks and dispersed work groups. The charette results in a design direction and more fully developed concepts that are carried through in design development. Throughout the development process, the organizational assessment team will take part in evaluations to ensure that the design reflects the goals and directions identified in the organizational analysis.

Project evaluation

The evaluation process includes both pre- and post-measurement and incorporates core methods used across projects as well as specific measures developed in each project. The project-specific measures assess organizational outcomes and also test hypotheses generated by the design. The evaluation process is discussed in more detail below. The overall plan and the specific methods address different POE goals, as noted by Cooper (2001). The first is the more traditional POE goal: to provide feedback to the GSA about the performance of workplaces it delivers. The second goal is to aid design by using the results from one project for the benefit of others by making results available to the teams doing organizational analysis and design. The third goal is to conduct a cross-project analysis to identify overarching themes, issues and findings that can be used as a basis for policy development and design guidelines.

Evaluating organizational effectiveness

All organizations strive to be successful. They spend vast amounts of time and money tracking internal and external indicators of their success as a way both to tell their story to clients and shareholders and to make improvements to their business. Although management specialists approach the concept of 'success' from many different perspectives, there appears to be considerable agreement regarding desired outcomes (Sink, 1985). These factors are shown in Table 1.

Table 1 Organizational effectiveness factors

Achieving organizational mission
Product/service quality and value
Customer satisfaction
Capacity for innovation and creativity
Adaptation to organizational and technological change
Effective information sharing and communication
Employee attraction and retention
Effective group and individual work
Quality of work life
Developing partnerships and alliances
Operational efficiency
Image and branding

This does not mean, however, that all organizations emphasize all of these outcomes. The particular success factors in any organization depend on the nature and structure of the organization and its work focus (Baker and Branch, 2002). One of the outcomes of the organizational context analysis described above is the identification of key effectiveness factors that will be measured in each project.

Building the workplace Balanced Scorecard

The application of the Balanced Scorecard (BSC) in the public versus private sector has one key difference. In the private sector the focus is ultimately on profitability and financial success. In the public sector, the focus is on mission accomplishment (Niven 2002). As Niven (2002, p. 298) notes:

Flowing from the mission is a view of the organization's customers, not financial stakeholders. Achieving a mission does not equate with fiscal responsibility and stewardship; instead, the organization must determine who it aims to serve and how their requirements can best be met. . . . Here the focus is on customers and serving their needs in order to accomplish the mission.

The BSC is used for research in two ways. First, it is used to initiate discussion about the organization: what is their mission, what constraints and pressures are they experiencing, how satisfied are their customers, how do they currently measure their success? The second use is to develop a research plan that links the workplace to the business goals and success measures. This use of the BSC includes the development of a 'strategy map' and a measurement matrix. The strategy map connects the measures used in a local operating unit back to the highest-level goals of the corporation, or in the case of the governmental or not-for-profit entity, to its mission. Several layers of strategy maps may be required to make the connection, depending upon the complexity of the organization.

An example of a measurement matrix produced for the GSA regional headquarters in Chicago, IL, is shown in excerpted form in Table 2. Two key drivers for the organization were the desire to improve customer service overall and performance across all the key performance indicators for the organization. One critical aspect is the need to improve understanding of customer needs. The ensuing discussion with organizational leaders identified several behavioural and work practices that, they believed, needed to be changed in order to increase the likelihood of improving customer relationships. In further exploring the changing behaviours needed for improvement in each of the key performance indicators, which covered all four domains of the balanced scorecard, a similar set of practices was identified. Because of the interrelationships among factors influencing organizational performance generally and those specifically attached to any one outcome, there is no single one-to-one relationship between behaviour or work practice and performance outcome. However, there are direct relationships to the measures of outcome and to the hypotheses about the influence of workplace on behaviour. These are identified in the first column of Table 2 and include better integration and coordination across groups, more sharing of customer knowledge and more internal flexibility. The workplace strategies to support the desired changes are shown in the second column and include reduced visual and spatial barriers, more meeting and interaction spaces, dedicated project spaces, centralized project filing, and a more flexible infrastructure and furnishings. The third column identifies specific measures that will be used to determine whether desired changes have occurred. Recognizing that a behavioural or work practice change could affect several BSC domains, the specific domain that

would be affected if the desired change is accomplished is noted.

While it is early in this programme of research to generalize, in the cases for which there are prepared matrices, the development of testable hypotheses has exposed the weakness of many design ideas.

Developing the linked mechanisms map to test hypotheses

Once the final suite of measures is selected, the research team develops a more detailed linked mechanisms map (Wyon, 1996) to identify the hypothesized pathway connecting the physical space to behavioural and process changes and, ultimately, to organizational outcomes. An example is shown in Figure 1. One of the benefits of using the linked mechanisms map is that strong data from other studies can be used to validate links, so that each specific link does not need to be measured in each project.

Table 3 shows the application of this process to a specific case, concerning a group of capital investment analysts. Their organization's mission is to discriminate among a set of investment proposals to select the capital-constrained set that will yield the greatest overall benefit. It is understood that certain non-financial factors will enter into the capital investment decision-making process, but these are specifically identified in the investment goals and optimized for deliberately. (A parallel can be seen in an investment strategy that seeks to maximize return and limit investment in companies with sustainable manufacturing processes, for example.)

Table 2 Matrix for the strategic goal: improve understanding of customer needs

Desired change	Workplace strategies	Measures	CS*	BP	HC	F
Better project integration and coordination across groups	Reduce visual and spatial barriers within and between groups Provide more space for meeting and interaction	Communication and interaction patterns (observation and survey) Customer service surveys		X		
More sharing of customer knowledge	Provide centralized project files to encourage information sharing and an integrated knowledge of project status Provide dedicated project spaces to track progress Provide increased internal mobility through technology (wireless, portable devices)	Time to complete projects Space utilization Customer service surveys Organizational and situational awareness survey	X X	X X X	X X	X X X
Improve internal flexibility	Provide more flexible infrastructure and furnishings to support work practice changes	Spatial change and adaptation over time Change in churn cost	X	X	X	X X

*Indicates what domain of the Balanced Scorecard is affected by the change. CS, customer service; BP, business practice; HC, human capital; F, financial.

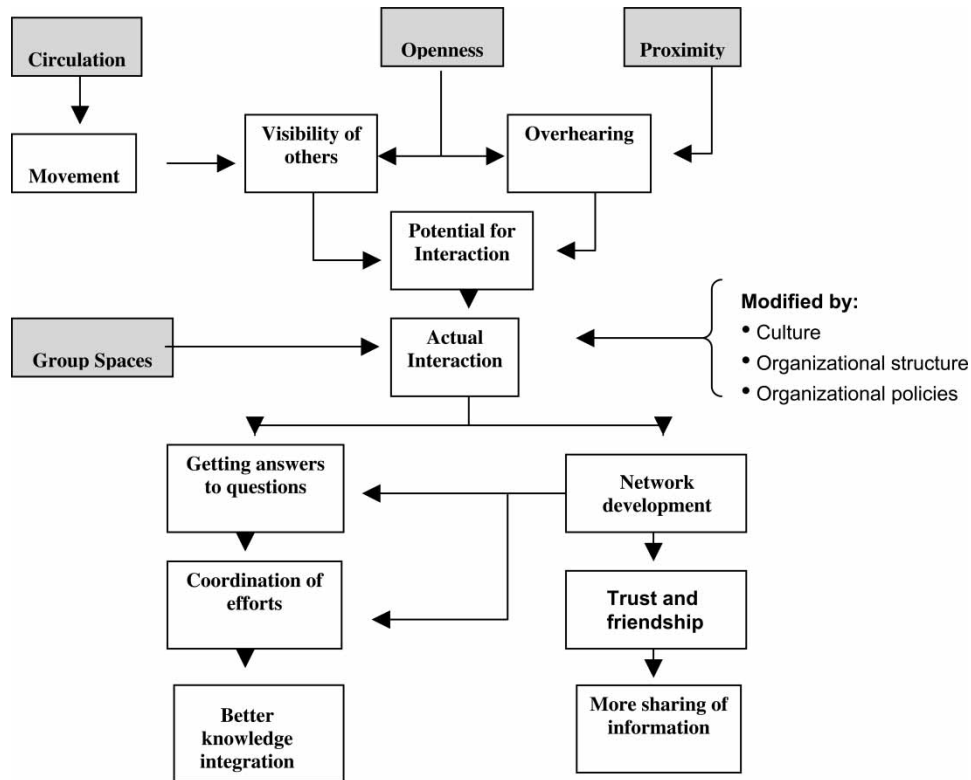


Figure 1 Example of a linked mechanisms map

Key research concerns and issues

The real work world is a tangle of relationships, processes, and context-specific behavioural norms and values. This, of course, makes it much more difficult to find unequivocal supporting evidence for hypotheses, especially for individual links between behaviours

and desired outcomes. Many factors influence all the outcomes that will be tested, regardless of the project. For instance, communication patterns are influenced not only by adjacencies and visibility, but also by how people feel about one another and whether communication and information sharing are rewarded by

Table 3 Specific example from a pilot project

Hypothesis	Increased collaboration will increase the quality of capital decisions
Rationale	Complex investment decisions benefit from collective experience applied with different analytical skills
Specific behaviours or outcomes	Frequency of interactions Increased understanding of organizational goals for project selection Sharing of financial analysis techniques Sharing of observations leading to identification of trends in project investment proposals Increased accuracy in investment proposals prepared for ranking Increased efficiency in the analysis of submitted proposals
Measures of the outcomes	Social network analysis (trust) Situational and organizational awareness survey Expert observation studies, e.g. video ethnography, room use records, facilitators' records Multidisciplinary team retention rate Meeting analyses Proposal review board minutes (for accuracy) Net time consumed, on average, per proposal
Link to business outcomes	Since all investment decisions are measured here by their net present value, the business outcome should be an increased aggregate net present value. The financial variables (market, cost of money, size of investment pool, etc.) can all be normalized with precision. It is acknowledged that the influence of management and process change can be less quantitatively adjusted for, but are susceptible to measurement. Quality of investment analyses is the primary business measure

the organization. Communication is also influenced by the Workplace 20·20 client engagement process. By asking people from all parts of an organization to consider jointly issues and goals, the relationships between those people may alter during the course of the project. People find both new allies and combatants in group endeavours, and this will change how they interact in the future.

Given that the ultimate goal is to use the workplace as a catalyst for positive organizational change, then the main outcome of interest is the overall pattern of results for each project as well as the patterns across projects. The present analysis for each project will include an assessment of the linked mechanisms map and an analysis of patterns revealed in the BSC.

Project-level analysis

Linked mechanisms assessment

The assessment of the linked mechanisms map will address whether the hypothesized links are supported and whether the results can be attributed to the workplace or if other organizational factors appear to be equally or more important.

- If hypotheses are supported, is one confident that the change is a function of the workplace and not other factors? Answering this question will require analysis of multiple data sources, including the surveys, behavioural observations of the use of space and post-occupancy context assessment. If the different measures show similar results and if the results support the hypothesized links, one can be more confident that the workplace has contributed to the outcome.
- If the outcome measure shows change in the predicted direction but the intervening variables have not changed, this suggests that other factors are responsible for the positive outcome. This would be verified through the post-occupancy context analysis that would include identification of organizational, management or other changes that might have occurred between the pre- and post-measurement phases.
- If the linkages in each pathway are verified but the high-level organizational outcome has not changed (such as improved customer satisfaction), then it can be concluded that workplace influences the behavioural or process change, but the behaviours/processes do not affect customer satisfaction and that other, unmeasured factors are more important.

Balanced Scorecard patterns

Specific questions to guide the analysis of the BSC results include the following. What is the nature of

the change in outcomes for each BSC domain? How many outcomes have changed in a positive or negative direction? For how many has there been no change?

In addressing the question of whether the workplace is a success, from the business perspective, the overall pattern of results is critical. Even if results are mixed, the organizational leaders may interpret them positively, especially if the most important goals have shown improvement. This is quite parallel with the common management practice of using performance indicators over time to measure progress toward long-term organizational goals.

It further supports the direction of the US Federal government, providing a stronger linkage between the use of what begins almost as a design discovery tool. The Government Performance and Results Act of 1993 mandated that all US federal agencies prepare performance measures that would enable the elected decision-makers to determine if money would be and had been spent effectively for the aims of the appropriations acts. The initial reports of agencies to the US Congress were dismal. One of the Comptroller General's functions is to rate the adequacy of the reports, as this evaluation related directly to the Comptroller General's fundamental function: namely, to determine if money has been spent properly. Not one agency received a passing grade (Comptroller General, 1998). Nevertheless, and perhaps because of this inauspicious beginning, agencies have been attempting to set in place a suite of measures that adequately meet the requirements of the law and also provide a useful method for managing complex operations.

Preliminary findings and lessons learned

As one can tell from a quick overview of the process, it is more complex than traditional programming and space delivery. Does the time and effort create value for the client and other stakeholders (Congress and tax payers)?

The benefits to date come primarily from the initial organizational analysis. For most clients, the questions pursued in this phase are unexpected and force them to think about what they do, how well they perform their key business activities and where they want to be in the future. In contrast, typical federal workplace projects begin with a discussion of head count and available space.

By starting with a discussion of the organization's mission, core values and business goals, the project starts in a fundamentally different place, allowing for a much broader range of discussion. It is a mind-expanding process, not a limiting one. It is found that client organizations value the reflection on what they do and why, especially when it is not forced upon them as part of an externally driven need for

reorganization. As noted by a manager for one of the pilot organizations:

I believe the approach and methodology that the WorkPlace 20·20 effort is applying offers an extremely valuable tool for organizations to better determine who they are, how they interact and identify arrangements that facilitate a positive workplace space arrangement. Could we have come up with a similar arrangement without going through the 20·20 process? Maybe. For the little bit of effort we were required to put into supporting the 20·20 studies, we reaped far greater gains in understanding and appreciating the complexity and total involvement of the entire Division in our core business processes. This may be an intangible benefit that provides a better perspective to our entire Division on how important each and everyone's job is to carrying out our mission.

(J. Kaplan, personal communication, 2004)

The early sessions on mission and business goals led another WorkPlace 20·20 organization to rethink its full suite of sites, rather than focusing on just the initial pilot location. In a call centre in Fort Worth, Texas, the client requested improved physical conditions for a call centre housed in a shed attached to a warehouse. In the extreme climate of Texas – very hot and humid in the summer, bitterly cold in winter – the un-insulated shed was both physically uncomfortable and expensive to operate. As a result of the organizational focus, the client team examined the interdependencies of some related teams located elsewhere in the area, which led to a desire to examine all organizational links in the metropolitan area. The engagement then changed to develop first a state-wide real property asset portfolio strategy and only then solve the local physical problem within a much wider and more comprehensive context. The result was a consolidation that avoided all the difficult renovation costs associated with creating call centre offices within an old warehouse, a total reduction in space used, better accommodation for the call centre, and a long-term plan that has the potential for further organizational improvements, regardless of the real-estate savings.

Another benefit for many organizations has been the ability to visualize previously 'hidden' work practices and relationships. Many everyday activities are hidden from view because they become routine and institutionalized and therefore not subject to reflection. While this is often perceived as the way to do things efficiently, the opposite is often true. Routines often develop to 'work around' constraints in the environment. For instance, one workplace consulting team identified numerous old and unsolved problems that

were identified as normal work practices, but which ultimately interfered with the desire for groups to work more effectively together. The specific issue dealt with access to document files (a common issue in office work). Each worker wanted his or her own files because it was perceived as more efficient; the result was piles of documents spilling off of desks and covering floors. A traditional programming process may have looked for more efficient storage at the individual level. The WorkPlace 20·20 organizational analysis instead uncovered the deeper reasons for these behaviours and the consequences to the organization. Individuals clearly wanted easy access to data; having files nearby meant they did not have to leave their workspace. However, the files created visual chaos and barriers between individuals and groups, and reduced the spontaneous encounters that occur with movement through the office. While this was perceived as efficient at the individual level, it effectively stunted the ability of groups to work together because everyone remained hidden in his or her private workspace. The discussions generated by the WorkPlace 20·20 process enabled the group to realize that the current situation was detrimental to their overall success, thus opening the potential for changes in workplace design and utilization.

In another example, WorkPlace 20·20 methods helped one client gain a better understanding of its key work processes. Workers tend to know their own work sphere, but often have little understanding of how it connects to others as well as to the overall mission of the organization. The WorkPlace 20·20 analysis methods include tools and techniques for mapping work processes, identifying bottlenecks and problem areas, and relating observed behaviours to beliefs about work. For instance, one method developed by one of the workplace consultants uses an ethnographic technique (shadowing) to identify and map critical work processes of different groups. The method enabled a discussion of key relationships and communications that needed to be supported in the new workplace.

The discovery process illuminates many other contradictions and inconsistencies between beliefs and actual behaviours, or between espoused culture and how things actually get done. For instance, a narrative assessment of interviews and focus groups used in one project identified conflicts between what is believed to be important versus what is actually done. In one of the groups studied, people believed that experience rather than training was important to learning how to do their jobs. A critical part of the learning was the need to interact and communicate often. Yet, at the same time, people did not want to be bothered and preferred to focus on their work without distractions from others. By articulating this unrealized conflict, the group was able to discuss how to balance more effectively the need for communication and individual work.

Barriers and constraints

Given the complexity and novelty of the WorkPlace 20·20 process, there are also barriers and problems in these early stages of programme development. The complexity is manifest in the greater number of relationships and stakeholders that need to be managed. Workplace consultants, designers, construction contractors, researchers, GSA personnel and clients all need to be trained about the process and integrated into the decision-making. This requires more time for learning, meeting, reviewing reports and documents, record keeping, and progress tracking.

The novelty of the approach and the intention (improved organizational effectiveness) has also been a barrier to some potential clients who have questioned how the workplace can possibly be linked to organizational effectiveness. For those who see space primarily as a cost centre and a means of housing the workforce, the organizational focus can be a stretch. Even in these cases, however, a successful presentation and early discussion can move the project in a more strategic direction. For example, in one case, a project met early resistance. However, after several meetings and discussions of business goals and organizational issues using WorkPlace 20·20 techniques, the client enthusiastically joined the pilot project group and has also opted to develop a 'learning laboratory' to assess alternative workplace designs and links to organizational outcomes.

Another frequently encountered barrier is the transition between the organizational assessment and concept development (carried out by workplace consultants) and the design translation (carried out by a design firm). There are two main issues. First, the Strategic Brief prepared by the consultant goes well beyond a traditional programme of requirements. It contains a scenario and concept development and refinement, resulting in a concept for the new space that includes suggestions about the balance between private and group spaces, adjacencies, furniture attributes, and recommendations for ambient conditions. In some cases, the designer has largely ignored the concepts and recommendations in the Brief. In other cases, however, the designer has been involved with the project from the beginning and has been able both to influence and understand the rationale behind the recommendations. This latter situation is obviously a much better one, but it is not always possible because the designer may not have been selected when the WorkPlace 20·20 process was initiated. The second concern with the translation to design and construction emanates from the client. It is found that clients sometimes abandon key design concepts when faced with spatial or budgetary pressures, resistance from workers or skepticism from designers.

Emerging strategic lessons

The WorkPlace 20·20 process itself is undergoing revision to reflect better the nature of the federal customers. A process that works well for a large, complex organization may not be useful to a 30-person office. Yet each benefits from considering how to use the workplace as a tool to achieve organizational goals. Thus, the project team is developing a process that is more scalable, with varying methods and techniques, but with the same focus on organizational effectiveness.

In addition, there is a strong desire by most stakeholders and team members to develop more effective ways to gain information about the client rapidly and over a shorter period. This 'rapid engagement' process, still in the midst of development, will develop ways to gather information quickly on organizational context and issues, such as external and internal drivers for change, existing problems and constraints, and desired new directions. The information, gathered in a short period by a multidisciplinary team (perhaps, in a week-long site visit) will provide the basis for key decisions regarding future pathways. The organization may decide, for instance, to hold off on a workplace design in order to deal with organizational issues first. Or it may decide to proceed rapidly with more detailed programming and design. In any event, the rapid engagement process will provide the organization with valuable information on its own functioning and future workplace needs.

The success of the WorkPlace 20·20 programme will depend not on the success of any given project, but rather on the ability to create more general understandings about the links between the workplace and organizational business goals. The authors fully expect to find many routes to success, not just a few. The true value of the WorkPlace 20·20 programme will be the translation of its findings to policy and service delivery in the years to come.

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