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AN OVERVIEW

THE INTEGRATED workplace

a comprehensive approach

to developing workspace

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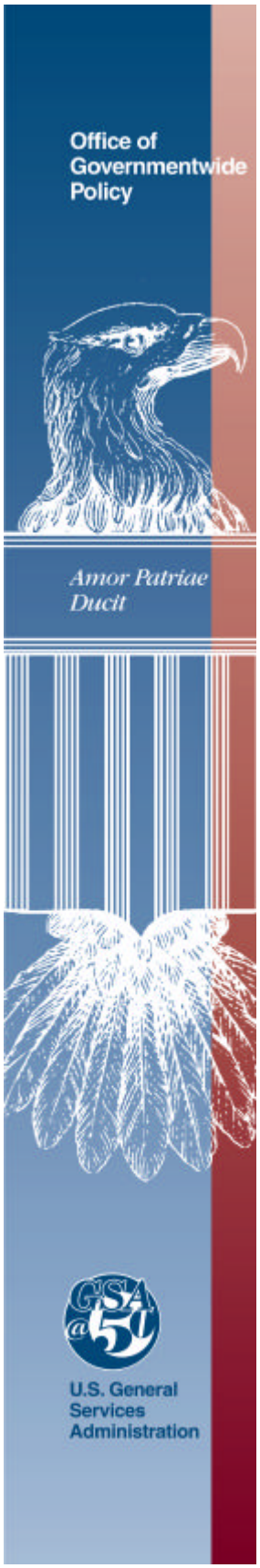
Adm n strat on

OFFICE OF REAL PROPERTY



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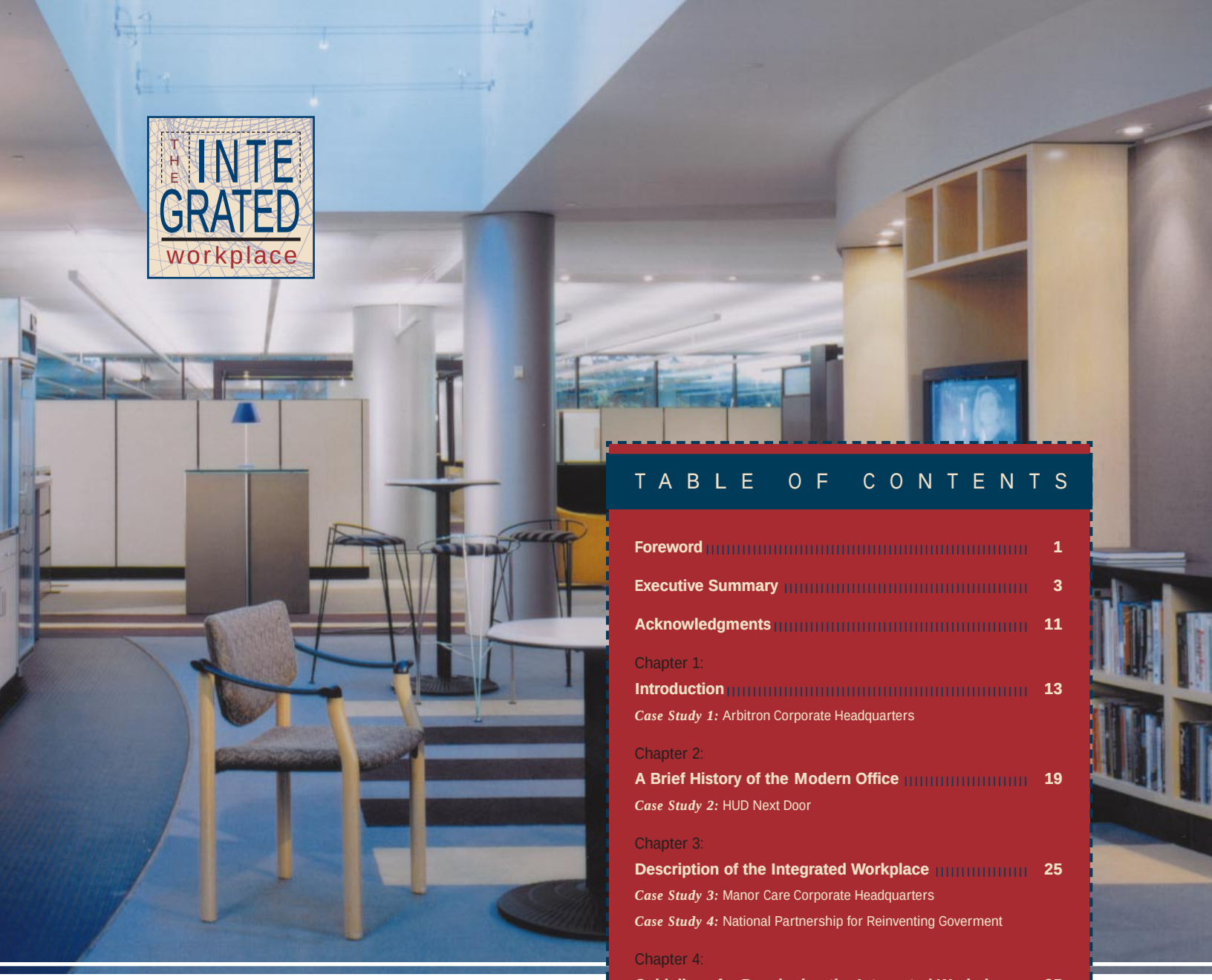

THE INTEGRATED workplace

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Cover: Courtesy Steelcase, North America

THE INTEGRATED WORKPLACE:

A Comprehensive Approach to Developing Workspace

U.S. General Services Administration

Office of Governmentwide Policy

Office of Real Property

The Office of Governmentwide Policy is pleased to issue *The Integrated Workplace: A Comprehensive Approach to Developing Workspace*. This report has been prepared to assist in developing Federal workplaces that best support the mission and goals of the people using them.

I would like to acknowledge the support of David L. Bibb, whose Office of Real Property responded to the need for rethinking our workspace as recognized by Vice President Al Gore, GSA Administrator David Barram, and many forward-thinking private corporations. This report was prepared by a multidisciplinary team under the leadership of Stanley C. Langfeld, Director, Real Property Policy Division. The team leader for the project was Rob Obenreder, and the team members were Hank Aldag, Deborah Connors, Jonathan Herz, Wendell Joice, Gary Jordon, Jill K. Shafer, Joanne Shore, and Ray Wynter. Additional assistance was provided by Melanie Anderton, Patrice Coleman, Carolyn Newsome, and Tanya Gross.

I also wish to thank all the dedicated real property, human resources, and information technology professionals from the many Federal, academic, and private sector organizations who participated in discussions and provided input and review for this report. It could not have been produced without the collaborative effort of this diverse group.

I think you will find the information contained in this report helpful in providing workspace that can take your organization into the twenty-first century.

G. Martin Wagner

G. Martin Wagner
Associate Administrator
Office of Governmentwide Policy
U. S. General Services Administration

Imagine

A workplace that is specifically designed to support your office's mission and that is integrated with your organization's strategic plan

A workplace that serves the needs and work practices of the employees

A workplace that can be quickly and inexpensively adjusted by the user to maximize his or her productivity and satisfaction

A workplace that is comfortable, efficient, and technologically advanced and allows people to accomplish their work in the most efficient way

A workplace that meets your office's needs and justifies its cost through the benefits gained

Imagine a way to create such a place.

It's called the Integrated Workplace.

What Is the Integrated Workplace?

The Integrated Workplace is the result of a collaborative, multidisciplinary approach to developing and providing workspace, uniting your organization's strategic real property plan with your organization's strategic business goals. It responds to the people and work practices of each individual and group, and provides them with the physical space and tools needed for their success.

Why Is the Integrated Workplace Important?

Corporate America has discovered that the only way to remain competitive and stay ahead of rapid changes in business and technology is to continually reinvent itself, using workspace as a strategic tool that helps to meet those goals. The way the Federal Government works is also changing, and there is greater competition both within and outside of the Federal sector for quality employees.

To take advantage of the current changes within Government to provide better workspace that best suits its needs, the General Services Administration's Office of Governmentwide Policy, Office of Real Property established the Integrated Workplace Initiative. It will identify and promote a more comprehensive approach to providing leading-edge workplaces that will assist Federal agencies in creating cost effective, flexible, efficient office environments that enhance productivity and assist in attracting and retaining a quality workforce.

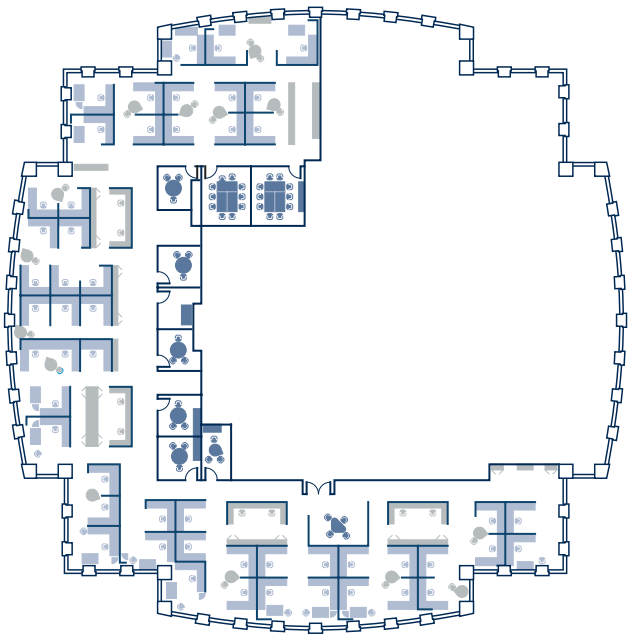
The MTV Offices in Santa Monica California were designed by Felderman and Keatinge to provide a home-away-from-home feeling with references to the local sun, sand, and surf.

Courtesy of Haworth Inc.

The Integrated Workplace approach will help you develop facilities that support your changing business practices by involving all those affected by the workplace. With the Government's ongoing reinvention and workforce reductions, organizations must work smarter with fewer resources. By using the Integrated Workplace as part of your strategic development plan, matching business goals to workplace designs, you can consolidate and reconfigure the spaces where you work while providing people with the tools they need to support the organization's mission.

The Integrated Workplace is important because of what it can produce for your organization, such as:

- Improved productivity
- Improved employee job satisfaction
- Better use of limited resources—namely, people, space, time, and money



Herman Miller systems and freestanding furniture were used at Nationsbank to create three work zones – individual, interactive, and public/conference - that can accommodate the different work styles of the organization.

Used with permission of Herman Miller Inc.

Who is the Office of Real Property?

The Office of Real Property develops policies and practices to guide the acquisition, development, management, and disposal of the U. S. Government's real estate portfolio. As part of the General Services Administration's Office of Governmentwide Policy (OGP), the Office of Real Property collaborates with other Federal agencies to improve management of the Government's real property, including development of work environments that can best serve us now and accommodate future change.

How Can the Integrated Workplace Help You?

Improve Productivity

You know intuitively that a person who is uncomfortable in his or her workspace is less productive than one who is comfortable. Studies have also proven this fact; good workspace improves productivity and poor workspace reduces productivity. An integrated approach to the workplace can help assure that you have provided the best space for the required tasks.

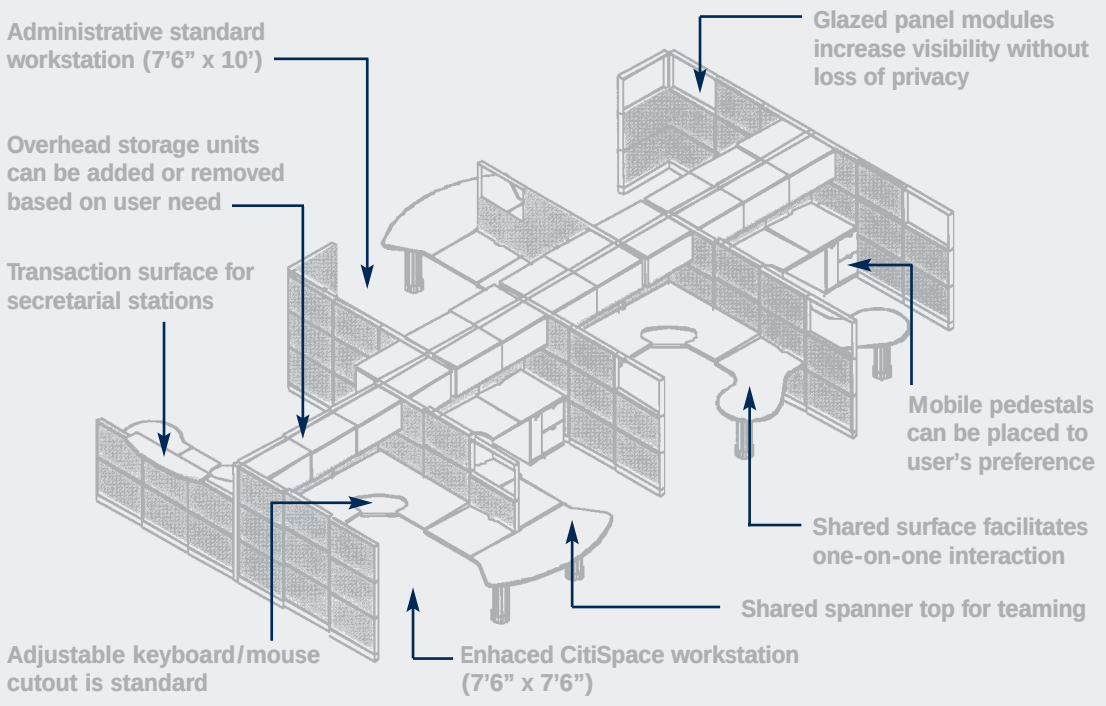
Improve Employee Satisfaction and Health

The work environment's ability to increase employee job satisfaction and its ability to attract and retain high quality employees has not been extensively studied, but there is some evidence to corroborate its importance.

Modular furniture systems at Citibank provide comparable amenities in smaller workstations that rely on shared areas to provide additional space.

Used with permission of Citibank.

MODULAR OFFICE SYSTEMS



On the other hand, studies have proven that the health, and thus the productivity, of building occupants is directly affected by the interior environment.

Improve the Bottom Line

Using an Integrated Workplace approach can provide benefits through improved productivity and better use of space. Preliminary cost-benefit studies have verified that the initial cost of quality facilities can be justified by the substantial gains they provide later in improved performance.

Other organizations have found that an integrated approach to developing their workspace resulted in a reduction of total space that saves on rent and maintenance costs. However, space reduction should be viewed as a secondary benefit to careful analysis of space function and need, and not the primary goal.

What Are the Basic Elements of the Integrated Workplace?

There are three basic elements that must be considered together as an interactive whole in order to provide integrated solutions to your workplace needs. They are:

Different types of work areas at the new Owens Corning Corporate Headquarters in Toledo, Ohio, support the various work processes of the organization.

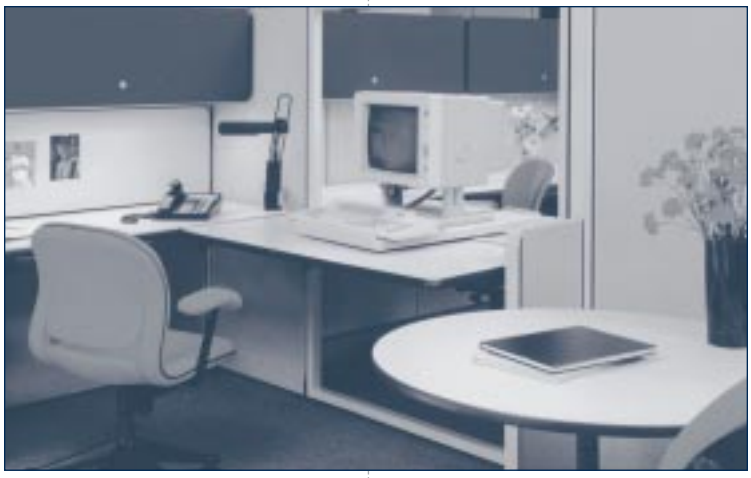
Courtesy of Steelcase North America.

1 People: The individuals who work in an organization, the work processes they use to accomplish the tasks that fulfill the organization's mission, and the culture or working environment that defines that organization. Important issues include:

- Understanding individual worker needs
- Understanding the organizational culture
- Defining and analyzing the organization's work processes
- Exploring workplace alternatives
- Managing organizational change

Work stations must be flexible and adjustable to support the necessary technology.

Courtesy of Herman Miller Inc.



Administrative workstations at the National Partnership for Reinventing Government provide flexible space while making a good first impression.

Photo by Hoachlander-Davis Photography courtesy of GSA Public Buildings Service Marketing Division.

2 Space: The building infrastructure that houses and supports the occupants, their work practices and technology. Important issues include:

- Providing adequate flexibility in the infrastructure
- Satisfying individual needs for personal comfort
- Using suitable space planning concepts
- Understanding and addressing important spatial characteristics
- Using appropriate, ergonomically designed furniture

3 Technology: All the engineered tools that support and enable people to communicate and process the information needed for their work. Issues include:

- Using technology that properly supports the organizational culture and work practices
- Accommodating future change
- Balancing cost and longevity
- Using suitable procurement and maintenance methods

How Do You Implement the Integrated Workplace?

Developing an Integrated Workplace is a continuous, reiterative process that flows through three basic development phases: planning, implementation, and post-occupancy management. The Guidelines section of this report will help you develop a plan for your workspace tailored to your organization's business needs. Critical to the entire process is developing a multidisciplinary project team comprised of both an in-house steering committee that represents all facets of the

organization and talented professional consultants who are well suited for the particular project and organization.

What Did We Find?

The general findings of this study are that:

- The quality and suitability of workspace greatly affects the productivity and well-being of those using it.
- A clear definition of an organization's mission and goals and the work practices used to achieve them are prerequisites to developing the best workspace.
- Since people are the most important resource and greatest expense of any organization, the long-term cost benefits of a properly designed, user-friendly work environment should be factored into any initial cost considerations.
- Strategic organizational planning must include real property considerations and have participation from facilities professionals.
- Federal agencies need to keep informed of new workspace issues throughout the Government and the private sector.
- As Government organizations continually reinvent themselves to remain competitive and stay ahead of rapid changes in business and technology, providing workspaces with flexibility to adapt to change is the most critical factor in supporting new work processes and technology.
- Support from senior management is essential for successful implementation of an Integrated Workplace approach.
- The Integrated Workplace development process is a reiteration of good design practice that is comprehensive and primarily focused on the needs of the people and work processes rather than on space standards and furniture requirements.

What Do We Recommend?

Based on the research and findings of this study, we recommend that:

- All Federal agencies should promote and use Integrated Workplace practices in developing their workspace.
- Procurement requirements, management processes, and space standards or guidelines

dealing with Federal workspace should be reviewed and amended, where necessary, to facilitate an Integrated Workplace approach.

- Senior management should be champions for better workspace.
- Budget and procurement decisions should encourage and support solutions based on a life-cycle model rather than a first-cost model.
- The Federal Government should promote and fund further research on the workplace, including the effects of the workplace and work practices on people's health, productivity, and job satisfaction.
- The Office of Governmentwide Policy should develop a method for sharing information on workplace issues throughout the Federal Government.
- The Government's successful Integrated Workplace solutions need to be recognized and rewarded.

ACKNOWLEDGMENTS

The Integrated Workplace Team wishes to thank the following experts for their contributions to *"The Integrated Workplace Interagency Roundtable"* held on March 12, 1998, and the *"Integrated Workplace Agency/Industry Workshop"* held on May 19, 1998.

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Vice President, Gensler

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Information Management Consulting, Platinum Technology

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> TOM GROOMS
GSA Public Buildings Service

THE INTEGRATED workplace

chapter 1

Introduction

INTRODUCTION

Because of the many changes being made today in the way the Federal Government works, the need for changing the workspace to support these new business processes has never been greater. Consolidation of space due to downsizing of the Federal workforce and the reorganization of Federal agencies have created an unprecedented opportunity to rethink the way our workspace affects individual performance and supports our missions and goals.

To take advantage of the current changes within Government to provide better workspace that best suits its needs, the General Services Administration's Office of Governmentwide Policy, Office of Real Property established the Integrated Workplace Program. It will identify and promote a more comprehensive approach to providing leading-edge workplaces that will assist Federal agencies in creating cost effective, flexible, efficient office environments that enhance productivity and assist in attracting and retaining a quality workforce.

This initiative is part of the Office of Governmentwide Policy's ongoing efforts to develop guidance for implementation of the Federal Real Property Asset Management Principles of October 1996 that included issuance of the *Office Space Use Review: Current Practices and Emerging Trends* in September 1997. Just as the President's National Performance Review of 1993 directed Government agencies to rethink business practices to create downsized and streamlined Federal Government, the *Office Space Review* encouraged them to rethink the space needed to support their reinvented missions.

Going beyond prescriptive utilization rates, the *Office Space Use Review* urged agencies to develop appropriate standards by identifying substantive physical space needs to support their mission and to compare the results to the private sector through performance measures such as cost per employee or percentage of total administrative budget. The *Office Space Use Review*, initially intended only to provide guidance on space

Varying systems furniture panel heights allow for both privacy and communication at new offices for NationsBank Business Marketing Group.

Courtesy of Herman Miller Inc.

standards, asked agencies to reconsider the use of traditional offices and to look at alternatives to in-office work environments, considering best practices and emerging trends such as telecommuting centers and working at home. The report concluded:

> *The workplace of tomorrow will no longer be the traditional workplace of today. The need to be competitive, to support new ways of working, and to keep a skilled work force will require flexibility. Technology has made it possible, and a growing consensus in society that work and home life have become unbalanced has made it desirable.*
>
> *(Office of Real Property 1997a, p.1)*

The *Office Space Use Review* study encouraged Government agencies to rethink space needs for their reinvented missions. This report encourages agencies to create innovative work environments in those spaces where their new business practices can succeed.

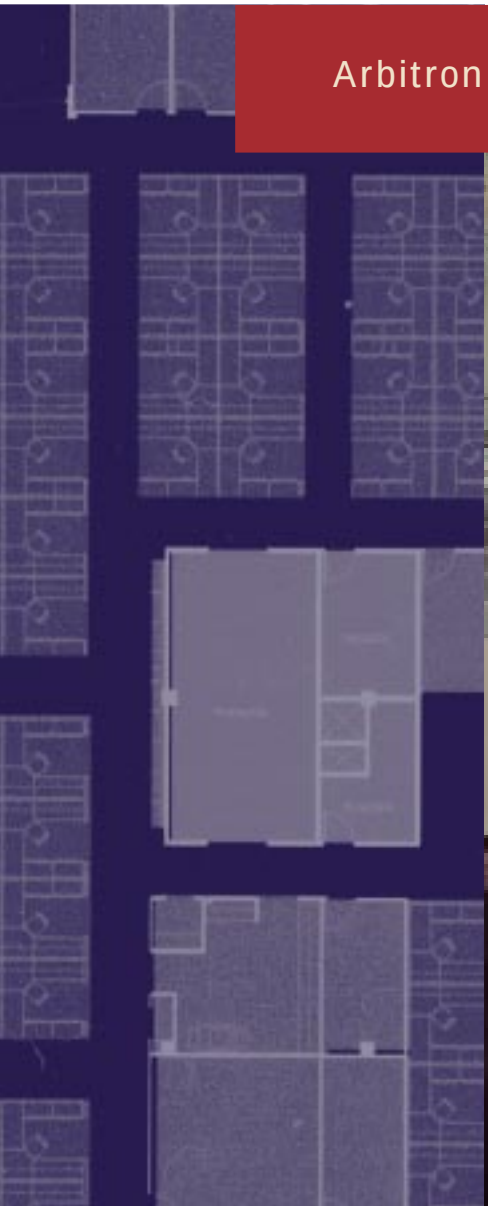
The design of new work environments requires consideration of how three elements of the workplace—people, space, and technology—interact to support the business goals. Creating successful work environments requires a multidisciplinary approach involving the entire organization, including end users, management, information systems and human resources personnel, facility managers, and design professionals. This report presents ways agencies can begin to think about those new environments, and, through its guidelines, take steps to plan and implement Integrated Workplace solutions.

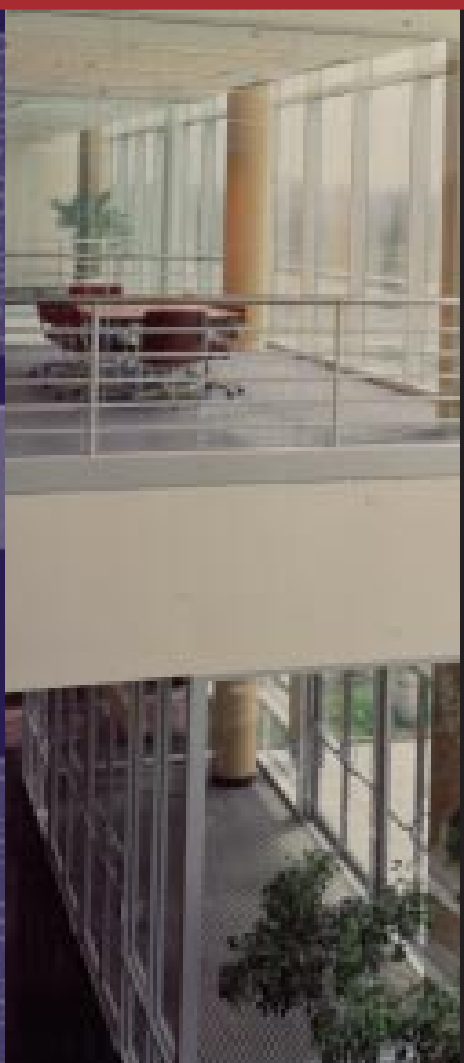
THE INTEGRATED workplace

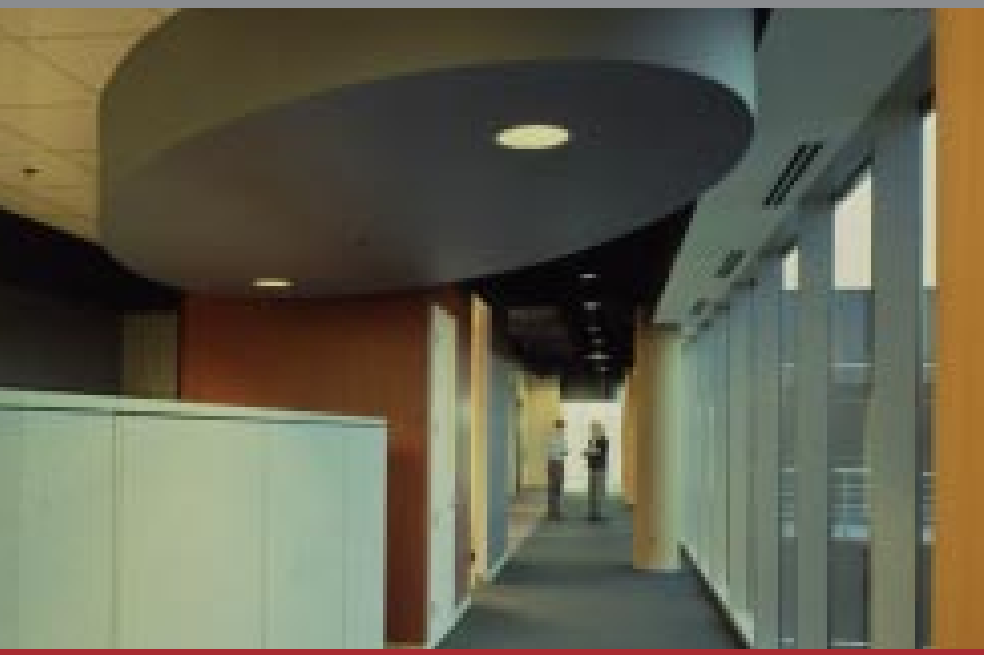
1

case study

Arbitron Corporate Headquarters







Arbitron Corporate Headquarters

Columbia, Maryland

Occupants

The Arbitron Corporation

Design

Greenwell Goetz Architects

Contact

Bob Reinhart, Facility Manager,
410 312-8360

Project Background

The Arbitron Corporate Headquarters building is located at 9705 Patuxent Woods Drive, Columbia, Maryland. This 140,000-square-foot, five-story building is well placed and has a modern tinted glass facade. Each floor has approximately 65 workstations, and the building presently accommodates 400 employees.

The build-out for Arbitron was specially noted and acclaimed for its design, flexibility, and the reuse of existing systems furniture. This design resulted in a 25% reduction of the square footage use per person, consolidated many types and sizes of workspaces into three standard workstations, and facilitated more team communication.

Many compatible and common themes were found between the company's philosophy and the design of the building. Arbitron Corporation had decided to make a considerable change in the way it did business by getting out of the television ratings business and concentrating solely on radio ratings. The design of the new offices had to reinforce the new way of doing business, facilitating the refocusing on radio ratings. This change also allowed the consolidation of several separate office facilities and required management to focus on being flexible and accommodating employees to reduce the loss of skilled workers.

Integrated Workplace Concepts Employed

People

> Employees had direct input into the design of the office areas through the employee design team that interviewed them and reviewed space mock-ups. The ideas for the coffee areas; teaming, conference, and teleconferencing rooms; the large meeting rooms with a service kitchen; self service cafeteria with an outside café area; and the workout area came from the employee design team.

> To promote good health, a workout area with showers and a locker room is provided, and every bathroom has a scale. The building is also a non-smoking building.

> Many areas have high ceilings to increase the feeling of spaciousness.

> Since the radio ratings business is considered less formal than television, cultural changes were also needed. Arbitron now allows casual dress ("business casual"), and lets their clients work in their office.

> Although they searched for sites in the "Metro area and beyond," Arbitron finally picked Columbia, Maryland, because most of the employees liked the lifestyle and amenities the location had to offer.

> A tastefully designed coffee station equipped with a sink and a microwave oven was provided in the outside hall of the employee workspace. Coffee is free.

Space

> Space was used as a catalyst for change, with office locations, flexible design, and facilitating technology encouraging a fresh environment.

> At least 3-4 teaming rooms, located at the corners of each floor, were provided. The rooms accommodate 10-12 people, and have floor-to-ceiling glass.

> A large conference room is located in the middle core area of each floor, next to common use areas, where copying, mail pick-up, and administrative tasks can be done.

> Only three sizes of workstations were used: 120 SF for managers, 68 SF for professionals, and 58 SF for clerical workers.

- The few private offices are located in the interior, with glass walls that receive natural light from the surrounding open office space.
- The design incorporates the reuse of existing systems furniture.
- The design yielded a reduction of space per person and reduced the operating costs.
- The lessor provided all design and construction services.

Technology

- The facility design allows technical flexibility and connectivity.
- Lights with motion sensors turn on and off automatically.
- All offices are interconnected with a LAN system.

Project Results

(best practices, lessons learned, benefits gained)

- Employee participation is the key to a successful consolidation and move.
- By consolidating from several buildings to one location, more employees can be housed in less space. Shared common areas, copier/support areas, front lobbies, etc., allow more personnel to be housed for a lower cost.
- Changing the culture in the workplace is very difficult. Moving the entire company to a new location provided a new environment that assists in promoting “change.”
- Structuring the project with the landlord delivering the entire office build-out concurrently with leasing the furnishings allows a company to move and operate with very little up-front cash. This “lease everything” concept also allows a company to trade up on its technology at the end of the lease period.
- Reusing existing, company-owned furniture can offer substantial savings.

All images courtesy of Greenwell Goetz Architects.

About This Report

Just as each Government organization has a unique mission to accomplish in the service of the American people, so should each supporting workplace be a reflection of that uniqueness. This report cannot define the specific combination of work alternatives, space configuration, and technology that will guarantee the best work environments for each organization or employee. It does identify concepts and methods your organization should consider when thinking about how new work environments can best support your needs.

The concepts discussed here are a reaffirmation of sound design principles that often get lost in the fray of budgets, schedules, and politics. These design principles call first for systematically identifying and understanding your strategic needs and goals, and then carrying them out within the real

Accommodating people and their work practices is the primary goal of the Integrated Workplace.

Courtesy of GSA Office of Governmentwide Policy, Office of Real Property.

Photo by Walter Smalling courtesy of Gensler.

world parameters of your office. Focusing on the needs of the people and work processes rather than on space standards and furniture requirements, in conjunction with professional design assistance, will help your organization define workspace that suits your people and their work and that is within your budget. Defining your business goals and future direction, and communicating this to design professionals, is the first, key step in developing a successful work environment.

How and why the decision is made to develop new workspace is a critical one, and we encourage you to look elsewhere for help and expertise on business process re-engineering and strategic planning —to the National Partnership for Reinventing Government and related business consultants. Since we are the Office of Real Property Policy, the focus of this report and guidelines is on the physical workspace and what should go into its development. Once you examine how you are working and determine that new or renovated space will contribute to your organization's success, the ideas and knowledge presented in this report will help you to develop that space.

So this report is not a "cookbook," nor does it provide design standards. Rather, it attempts to provide an overall framework for change and to identify some important concepts and resources for your organization to use in its journey toward a more perfect workplace, where people are their most productive and satisfied.

One last word: Just as your work requires professional expertise and training to accomplish it successfully, so does the complicated practice of workplace design. It is not something for the inexperienced or the amateur. Finding the right professionals, both within and beyond your organization, is crucial to the success of your project.

How To Use This Report

The six chapters of this report are related, but fall into two broad categories. Chapters 1, 2, and 3 describe the Integrated Workplace and its basic elements and issues. Chapters 4 and 5 deal with implementation of Integrated Workplace strategies. The separate chapters can be used somewhat independently of each other and be referred to only as needed. If you are already familiar with the concepts, feel free to move on to the guidelines. The executive summary not only provides an overview for the report, but also contains the findings and recommendations. Abbreviated source references and specific page numbers, indicated in parentheses *(Sample Reference 1965, p.1)*, refer to the corresponding complete description in Appendix B.
A glossary of special terms is also provided. Case studies that illustrate implementation of Integrated Workplace Strategies appear throughout the report.

Study Procedures

This report is a summary of research, analysis, and discussions started in July 1997. We conducted a literature search of publications both in hard copy and on the Internet. We discussed issues with experts in both the private and public sectors through personal meetings, telephone interviews, fax, and e-mail. We held a GSA Roundtable Discussion on November 20, 1997, an Interagency Roundtable on March 12, 1998, and an Agency/Industry Workshop on May 19, 1998 to get participation and feedback from both Government and private sector professionals on workplace issues. We attended conferences and seminars on the workplace, including World Workplace '97, Advanced Building Systems Integration Consortium (ABSIC) Meetings, the Alt.Office West Conference and Exposition, the PBS National Workshop on Productivity, and the National Science Foundation's Planning Meeting on Workplace Productivity.

THE INTEGRATED workplace

chapter 2

A Brief History of the Modern Office

A BRIEF HISTORY OF THE MODERN OFFICE

How Did We Get to the Office of Today?

Federal office space in the Old Post Office circa 1900.

Courtesy of GSA Public Buildings Service Historic Preservation Office.

Excerpted and adapted from *Total Workplace Performance*, by Stan Aronoff and Audrey Kaplan *(Aronoff & Kaplan 1995, Chapter 2).*

The Office Facility

Throughout history, people have met to exchange information, make decisions, develop plans, and to buy and sell goods or services. They may have conducted these activities while seated on a carpet, amid the bustle of a coffeehouse, in the consulting room of a professional, or in an aristocrat's study. For businesses today, the office has become the setting of choice for the generation, coordination, and communication of information. It is a facility in which people can interact with each other, with their information, and with their information processing tools.

Our current concept of an office as a facility built especially for that purpose emerged in Europe in the mid-1800s. Office buildings of that time consisted of rooms that were rented to a single company or to several small firms for transacting clerical

Early bazaars were the forerunners of modern office space.

Used with permission of WDL Publications (Aronoff & Kaplan 1995).

or executive business. Since the emergence of the single-purpose office building, the office workplace has evolved with advances in construction technology, improvements in office equipment, and developments in organization theory.

Changing Styles of the Office

Office designs from the middle of the nineteenth century to today have primarily served the burgeoning clerical and administrative components of business. As organizations became larger, their growing clerical and administrative workforce, which had previously been housed in private and shared quarters, was accommodated in ever-larger general-purpose office spaces. The placement of enclosed offices on the perimeter created sizable interior spaces that became known as bullpens. It was common to have dozens, even hundreds, of clerical work stations in these expansive interior spaces.

Open bullpen office space for the General Accounting Office in the Great Hall of the Pension Building, 1926.

Courtesy of National Building Museum.

Bullpen office layouts in the Great Hall of the Pension Building circa 1920.

Courtesy of National Building Museum.

Bullpen layouts consisted of a rigid arrangement of desks, usually in rows. They provided individual workers with no visual or acoustic privacy and were typically noisy, poorly lit, and uncomfortable places to work. Ergonomics was not considered an issue in the office. Unlike factory settings, there was little concern for matching office furnishings to the task or to the individual.

In the late 1950s, a new office design called the Burolandschaft (translated from German as "office landscape") was developed in Germany. Two brothers, Eberhard and Wolfgang Schnelle, leaders of the Quickborner Team of management consultants, heavily promoted it. The office landscape design sought to provide flexible, interesting interiors that could easily be adapted to individual tastes and group needs. Layouts were spacious and used high-quality furnishings. Arrangements of live plants, artwork, and other unconventional devices were employed to divide the space into individual work areas. The concept underlying this design was for the physical layout to reflect a democratic and egalitarian style of management as well as to provide high-quality interiors tailored to the occupants' needs. It was a philosophy that fit well with the architectural design ideas that came into vogue in the United States and Canada during the 1960s

At about that time, Robert Propst, a U.S. inventor-researcher, was developing an unconventional approach to furnishing offices for Herman Miller, a major office furnishings manufacturer. His idea, called the "Action Office

The original Action Office™ Furniture System by Herman Miller provided greater flexibility in arrangement of the space and in workstation layout.

Courtesy of Herman Miller Inc.

Furniture System," was to replace such traditional office furniture as desks and credenzas with furniture components and panels that could be assembled into a wide range of work settings. Work surfaces, storage units, and other elements were hung on freestanding panels, which could be arranged as needed to form a complete office work setting. It was the beginning of what today is called systems furniture

As varying-height acoustic panels were introduced into the open office, floor-supported desks and storage units began to be integrated into the rectilinear panel system. This office layout of "cubicles" offered slightly more privacy while retaining space efficiency. Hundreds of office furniture designs are now based on this concept.

The use of systems furniture to create large open-plan areas was a divergence from the original office landscape design envisioned by Propst and the Quickborner Team. The office landscape employed high-quality furnishings and provided spacious work settings. By contrast, the open-plan/systems furniture design was mainly used to increase the number of workers who could be housed in a given floor area.

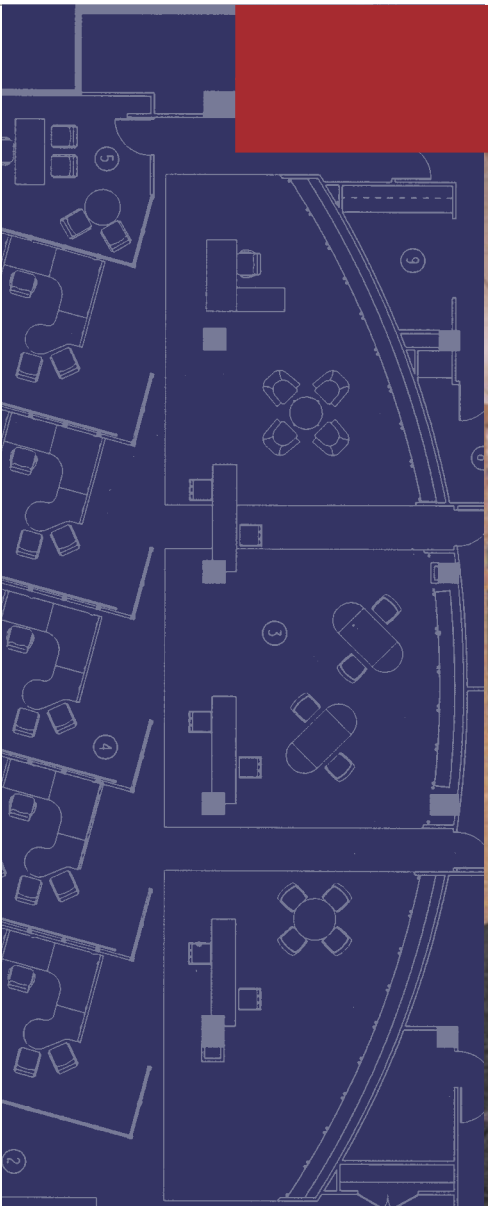
Compared with the bullpen arrangement, an open-plan/systems furniture approach offered more privacy, greater noise control, and more convenient storage of papers and files. However, most occupants still preferred the private or shared enclosed offices of the time. Proponents of the open-plan arrangement emphasized more open communication among office workers as a major benefit, even though occupants felt the lack of communication was not a significant problem. Early on, occupants of the new open plan layouts complained of a lack of privacy, noise distraction, and insufficient space.

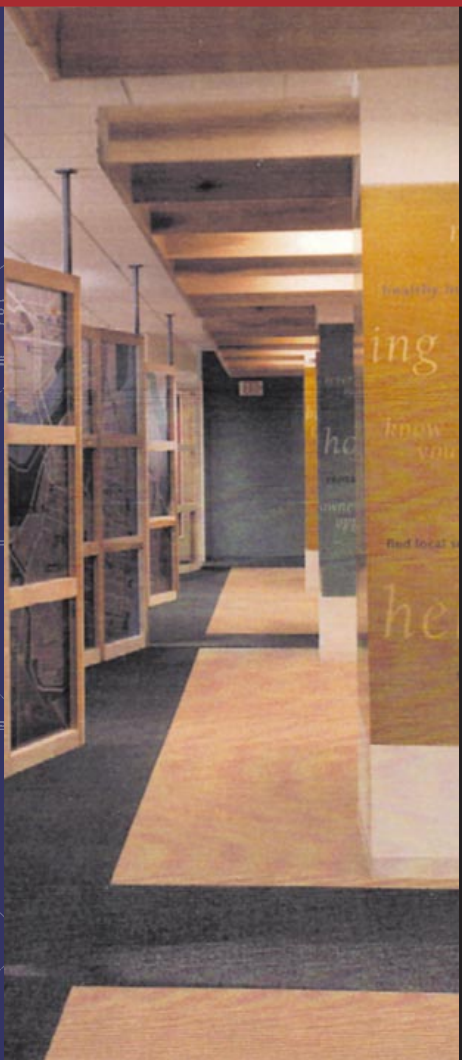
THE INTEGRATED workplace

2

case study

HUD Next Door





HUD Next Door

Washington, DC

Occupants

The U. S. Department of Housing and Urban Development (HUD)

Design

Richard Logan and Ernest Munoz
Gensler Associates

Contact

Lorrain Richardson, HUD,
202 523-4400

Project Background

In 1997, HUD started to design the prototype for its first storefront facility. Originally, the facility was to be located in Wilmington, Delaware. However, the immediate availability of a 7,000 SF space resulted in the first HUD storefront office being located in Washington, DC, at 801 North Capitol Street, NE

Before HUD began its storefront concept, they worked to understand what they did and to envision what they wanted to accomplish. From this critical self-evaluation, HUD recognized the need for easier public use, to be closer to the public (actually in the "neighborhood of the user"), and to have a positive mechanism for name recognition. To accomplish this, the management and design team knew they needed something very different and innovative to change the agency's image and operations.

The HUD Next Door prototype facility was designed and built to facilitate a new way of serving the public. HUD plans to reproduce this concept in other parts of the country to bring their services to the people. This new way of doing business was accomplished through a change in management concepts, design, and technology.

Integrated Workplace Concepts Employed

People

> The space is used as a catalyst for change. Office location, open design, and user-friendly technology encourage and support a friendlier way to conduct business.

> Management and designers worked in a collaborative manner to facilitate cultural change in defining a “new image” for HUD.

> A transition manager was used to help orchestrate the new conceptual changes of being service-based and people-oriented.

> Training was provided for each employee in the new business/ work concept.

> Flexibility and self-evaluation are needed to fine-tune the new work environment.

Space

> The space, combined with the technology used, is designed to facilitate the new “service to the customer” working culture.

> Space was designed in an open fashion that provided 18 specialty desks and computerized kiosks. This allowed for a more supportive and friendly office environment.

> The office consists of a large open area, with a small employee break room that allows flexibility in the configuration of the office space, literally putting the customer in the workplace.

> Interior kiosks provide access to printed forms and information.

> The office design encourages customer support with interchangeability of function. Each workstation can be used for the same or different tasks.

> To “get closer” to the customer, HUD built the office as a retail storefront in the neighborhood it serves. The door is literally open for walk-in customers.

Technology

> Software is especially user friendly, with multi-language instructions and touch screen technology.

> Walk-up ATM technology allows 24-hour access to HUD forms.

> Furniture, telephones, computers, and software are all “off the shelf” items, with few, if any, custom upgrades. Use of off-the-shelf technologies lets HUD produce many storefront offices using the same items, with few problems either in the use or acquisition of equipment and software.

> Office computers are connected with each other and with other regional offices through a LAN.

> Filing and document regeneration can be done at a workstation or from a kiosk. A customer can file or regenerate a form 24 hours a day using user-friendly software.

Project Results

(best practices, lessons learned, benefits gained)

> For a project to be successful, you must first understand what your office does and how you want to do business. By defining new business concepts, changes can be made to reflect new ways of doing business.

> Function should determine design, especially with a new concept. Don’t try to fit the new concept into an existing space.

> Avoid custom technology and furniture, if possible. Off-the-shelf items are proven, tested, and usually can be delivered in less time.

Photos by Walter Smalling courtesy of Gensler. Floor plan courtesy of Gensler.

Today's Office

It was the higher density of work settings that made the open-plan office most attractive to cost-conscious organizations. The goal was to squeeze as many people as possible into the minimum amount of space. Often, too little attention was paid to developing well-designed, comfortable workplace environments. In the 1980s, systems furniture like desks, tables, and chairs that could be used interchangeably and could readily support personal computers began to replace fixed office furniture.

Nevertheless, it was not until the early 1990s, when downsizing, restructuring, and reengineering efforts rushed through the American workforce, that Propst's and Quickborner's business-driven approach really gained favor. The importance

The Action Office™ accommodates different work surface types and heights.

Courtesy of Herman Miller Inc.

Robert Propst, designer of the first systems furniture, believed casual meeting areas were an important part of the modern office.

Courtesy of Herman Miller Inc.

Today's modern office provides varied work areas suited to specific work tasks. Window panels help distribute natural light and views while aiding communication.

Courtesy of Herman Miller Inc.

Lobby seating in the National partnership for Reinventing Government offices can also provide impromptu workspace.

Photo by Hoachlander-Davis Photography courtesy of GSA Public Buildings Service Marketing Division.

of having workspace that can adapt to the work needs, rather than adapting the work processes to fit the space, is once again being recognized *(Aronoff & Kaplan, 1995, p. 34).*

Today, the change to open environments is less about saving on operations costs than about reaping long-term benefits such as increased productivity and efficiency. While significant savings still result, organizations adopting this tactic will more likely convert the saved space into informal meeting rooms, snack areas, and project rooms or reinvest it into workplace tools that the employees themselves have identified as important for improving their productivity *(Duffy 1997, p. 80).*

More and more, the office environments of today's front-running businesses reflect the business goals and work habits of that organization and possess the flexibility and suitability that can adapt to rapid changes with minimal cost, while supporting high productivity and providing employee satisfaction.

THE INTEGRATED workplace

chapter 3

Description of the Integrated Workplace

DESCRIPTION OF THE INTEGRATED WORKPLACE

What Is the Integrated Workplace?

The Integrated Workplace is the result of a collaborative, multidisciplinary approach to developing and providing workspace, uniting your organization's real property plan with your organization's strategic business goals. It responds to the people and work practices of each individual and group and provides them with the physical space, technology, and connectivity required to let them succeed. As a collaborative effort, it involves all those who influence or are affected by the workplace in the development of that space.

It is also important to understand what the Integrated Workplace is not, at least for most organizations. As described by Michael Brill, a noted workplace theorist and practitioner, in a presentation at the Alt.Office West Conference in August 1998, the new office is probably not "the really groovy, wide open office with folks interacting informally all day and meetings happening everywhere—in jazzy settings, at the coffee bar, and in touch-down pods in the atrium." For most Federal employees, it is generally not working out of a briefcase with a laptop and cell phone all day. And it does not necessarily require the use of cutting-edge furniture and eye-popping, high-profile interior designs. Brill says what is true for most of the work settings they have studied and for the seventy alternative officing projects they have completed is that "individual workspace is still a primary tool, with people spending 60% to 80% of their time there. Of that time, most work is still solo-focused work requiring limits on distractions."

Franklin Becker of Cornell University and Michael Joroff of the Massachusetts Institute of Technology introduced the concept of the "Integrated Workplace Strategy" in 1993. They define it as follows:

> *It is a system that creatively combines wisdom about the nature of physical settings (where the work is conducted); the information technologies used in the performance of work (how data, opinions, and ideas are accessed,*

Passage™ freestanding system furniture from Herman Miller provides flexibility and ease of configuration to assist the designer in providing a sense of place and that is a key ingredient of good office space.

Courtesy of Herman Miller Inc.

processed, and communicated); the nature of work patterns and processes (when and how tasks must be performed to achieve business objectives); and finally, organizational culture and management (the formal and informal values, expectations, policies, and behaviors that influence all the other factors)

(Becker & Joroff 1995, p.1)

The Integrated Workplace is, in many ways, simply a reiteration and compilation of good design practice. The idea of integrating your office design with your work practices has been around at least as early as the 1950s with the Quickborner Study and again in 1968, when Robert Propst designed Herman Miller's "Action Office" furniture system to provide an office that could support the "constant state of radical change" that was occurring in business *(Propst 1968, p 12).* Propst identified many of the factors influencing the office that are still of concern today: accommodation of change, need for better communication, the diversity of office tasks and skills, and new management trends. Understanding the client's business and designing their office space to support their business practices is what Edward Friedrichs, President of Gensler Associates, credits with his firm's long list of repeat clients and the resulting growth of his company that made it the largest interior design firm in the world *(Interior Design 1997, p. S20)*.

Integrated Workplace strategies should be developed through a team effort that includes all those involved in developing workspace both from within and outside of your organization. This would include in-house and contracted building professionals (planners, realty specialists, architects, engineers, space planners, interior designers, construction managers, and facility managers), the space occupants, all levels of management, and professionals from human resources, information technology, communications, and finance. It may also include others deemed important to workplace development by an organization, such as marketing or public relations professionals.

Completely mobile, Crossings™ furniture from Haworth accommodates the frequently changing work teams at Gould Evans Goodman Associates in Kansas City, Missouri.

Courtesy of Haworth Inc.

The GSA Public Buildings Service has defined what they call the Hallmarks of the Productive Workplace. If the workspace possesses these qualities, it will have a positive impact on the effectiveness and well-being of the occupants.

Day-to-day, the greatest concerns in the use of the space are health, comfort, and reliability. People must be able to rely on having good indoor air quality to avoid illness and fatigue. They must have the ability to control their environment and use the space in such a fashion as to maintain reasonable personal comfort and avoid injury. Finally, they must be able to rely on the efficacy of the work support systems. Nothing can be more frustrating, demoralizing, and counterproductive as being provided with building systems or equipment, such as new technology, that is not properly maintained or supported. Adequate training and resources to use or maintain such systems must be provided.

HALLMARKS OF THE PRODUCTIVE WORKPLACE

Spatial Equity: The workplace is designed to meet the functional needs of the users by accommodating the tasks to be undertaken without compromising individual access to privacy, daylight, outside views, and aesthetics.

Healthfulness: The workplace is housed in a healthy environment with access to air, light, and water, and is free of harmful contaminants and excessive noise.

Flexibility: The workplace configuration adapts to typical organizational and work process changes but can also be readily restructured to accommodate major functional changes.

Comfort: The workplace allows workers to adjust thermal, lighting, acoustic, and furniture systems to meet personal and team comfort levels.

Technological Connectivity: Workplaces on-site (e.g. team space, conference/multimedia space, hoteling space) and off-site (e.g., telecommute center, home office) allow easy communication among distributed co-workers while allowing simultaneous access to data.

Reliability: The workplace is supported by state-of-the-art heating, ventilating and air conditioning (HVAC), lighting, power, security, and telecommunication systems and ventilating equipment that require minimal maintenance downtime and are designed with back-up capabilities to insure minimal loss of service.

Sense of Place: The workplace has a unique character, with an appropriate image and identity, enabling a sense of pride, purpose, and dedication for both the individual and the workplace community.

Source: GSA Public Buildings Service

Why Is the Integrated Workplace Important?

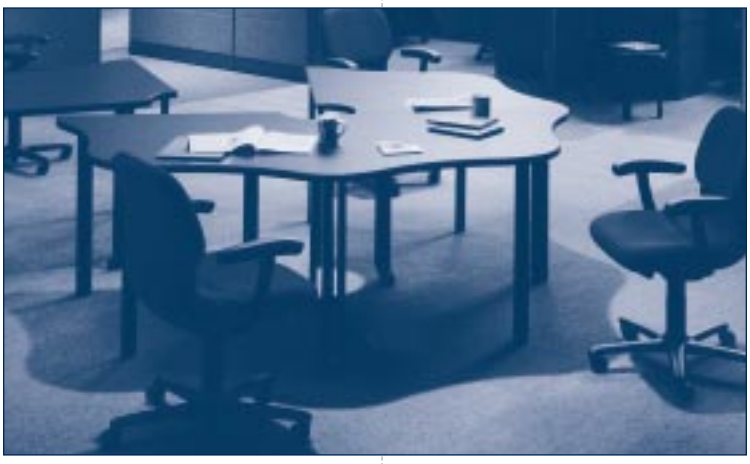
Why should you consider using an Integrated Workplace approach to developing your workspace? Corporate America is discovering the only way to remain competitive and stay ahead of the rapid changes in business and technology is to consider your workspace as a strategic tool in accomplishing your business goals and to include real property management staff as part of your strategic team. The International Development Research Council (IDRC), an association of top corporate real estate executives, has recognized the importance of this by devoting a great deal of resources to developing their "Real Estate 2000" Program that focuses on the strategic planning aspects of the workplace.

The broad reorganization of the Federal Government and the downsizing of the Federal workforce will result in extensive changes to the workplace as agencies consolidate and reconfigure space. Federal agencies will have to work smarter with fewer resources. "Faster, better, cheaper" is now the ubiquitous mantra of both government and industry. Further, with a shrinking supply of knowledge workers—people who can translate information into useful, marketable ideas—there will be increasing competition between Government and the private sector for competent people.

An Integrated Workplace approach is important to developing workplaces that will support these new mandates of a changing business climate. It will help assure this by involving all those affected by the workplace at the appropriate time, by matching business goals to workplace designs and by helping to develop and

At Steelcase Corporate Headquarters, a central communications room provides high-tech conference space with flexible furniture arrangements and state-of-the-art technology.

Courtesy of Steelcase North America.



The need for interaction and ease of reconfiguration in team environments can be accommodated by Steelcase System 9000© furniture.

Courtesy of Steelcase North America.

manage the changes to an organization and their effect on the workplace. It includes change management as part of the development process, so the space users can better understand the goals and expected benefits of the project and how it supports the mission of the organization. It will help provide space that best supports the mission and work practices of each organization through involvement of those responsible for the organization's strategic planning. It will provide space that is most efficient and flexible enough to accommodate future changes, because it will help design professionals and other consultants better translate the business needs of the organization into physical space.

Some benefits of using an Integrated Workplace approach in developing your office space could be:

> Improved productivity for your organization

> Improved employee job satisfaction and well-being

> The best use of finite resources, such as space, time, and money

Custom layouts for the Zondervan Corporation in Grand Rapids, Michigan are tailored to the organization's workspace needs.

Courtesy of Steelcase North America.

Natural light and operable windows at the Robert L. Preger Intelligent Workplace on the Carnegie Mellon University campus are features that can improve worker performance while reducing energy costs.

Courtesy of GSA Office of Governmentwide Policy, Office of Real Property.

Does the Workplace Affect Productivity?

Research shows that the work environment has a substantial effect on the productivity of the workers. Their performance is directly affected by the quality and suitability of the workspace and work tools—such things as a healthy environment, adequate workspace, correct type of workspace, and good communication and information technology tools. It is obvious that people who are constantly uncomfortable, or have to continually interrupt their work to make themselves comfortable, will be less productive than those who don't have to deal with such distractions.

Beyond intuitive observations, though, recent studies by the Rocky Mountain Institute indicate that improvements in thermal comfort, lighting, acoustics, and indoor air quality can increase worker productivity by as much as 6% and can reduce absenteeism by 8% to 45% *(ABSIC 1998, "The Greening of DEP," Kulp Boeker Architects)*.

A report by Johnson Controls indicates indoor environments can affect human performance from 5% to 15% *(Wyon 1996, p. 5)*.

Most current research on the effects of the built environment, as might affect the workplace, have been in the area of indoor environmental quality: thermal comfort, air quality, and lighting and their affect on task performance. Some examples, compiled by Carnegie Mellon University, are listed below *(Loftness et al 1995a, pp.106-110)*.

> DeMarco and Lister found direct correlation between the type of space and the performance of computer programmers in a coding competition they conduct every year. The top quarter performed 2.6 times better in larger workspaces with fewer acoustic and visual disruptions than the bottom quarter, which worked in smaller spaces with less visual and acoustic control.

> In studies of typewriting efficiency at different temperatures, subjects performed considerably more work at 68 degrees than at 75 degrees F.

> The combined effect of a new building and individual control of each workstation environment produced a 16% increase in productivity. Disabling the workstation controls resulted in a 1.5% drop in productivity.

> When tenants moved from an old building with operable windows to a new sealed building, there was an increase in absenteeism and a decrease in satisfaction.

Beyond the physical space, it is important to consider the effects of work practices, management practices, and the organizational culture on productivity, morale, and employee retention.

How Does the Workplace Affect Employee Satisfaction and Well-Being?

Satisfaction with the work environment and its ability to attract and retain employees is not well documented. However, there have been definitive studies that show the quality of the indoor environment can greatly affect the health of the building occupants.

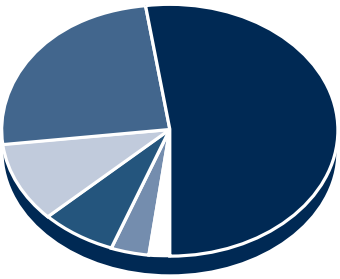
ENVIRONMENTAL FACTORS AND WORKER PERFORMANCE

	Computer Programmers	
	Best Performers	Worst Performers
	Top Quarter	*Bottom Quarter*
Workstation size	*78 square feet*	*46 square feet*
Noise level acceptable	*57%*	*29%*
Privacy level acceptable	*62%*	*19%*
Phone can be silenced	*52%*	*10%*
Phone calls can be diverted	*76%*	*19%*
Frequent needless interruptions	*38%*	*76%*

DeMarco and Lister found that the performance of computer programmers was directly related to the qualities of the space that were important to that type of work.

Source: Peopleware: Productive Projects and Teams (DeMarco & Lister 1987, p. 49).

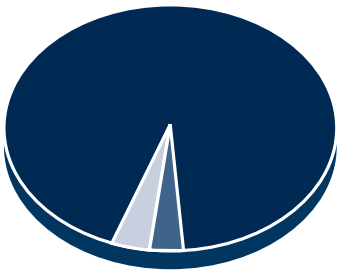
There is a great deal of subjective and anecdotal evidence to suggest that the workplace greatly affects the worker's job satisfaction and is an important element in helping to attract and retain staff. Many of the high-technology firms have provided special workspace amenities, such as in-house chefs, free day care facilities, and state-of-the-art health clubs, in an effort to both attract and retain scarce talent and to encourage people to stay longer at work. More than 70% of the Department of Energy's Forrestal Building employees rated workplace features such as access to windows, closed office space, workplace size, furniture, and



Annual Operating Costs

- Rent
  $ 3.4 K or 6%
- O& M
  $ 0.6-1.5 K or 2%
- Churn
  $ 0.75 K or 1%
- Technology
  $ 8 K or 13%
- Salary
  $ 35 K or 54%
- Benefits
  $ 15 K or 24% per employee

Source: Center for Building Performance and Diagnostics,Carnegie Mellon University



Life-Cycle Operating Costs

- Employee Salary and Benefits Costs
  90%
- Design and Construction Costs
  5%
- Operating and Maintenance Costs
  5%

Source: GSA Public Buildings Service

finishes important or very important to their productivity *(Loftness et al. 1995a, p.115)*. By helping to create a more effective and comfortable work environment, with the proper mix of location, functionality, quality environment, technology, and space amenities, an Integrated Workplace approach may help keep employees happier and more productive.

Studies show that the health and productivity of building occupants is affected by such things as air quality, types of materials used, temperature, humidity, access to the natural environment, and ergonomics. Sick Building Syndrome and Building Related Illness are well-documented problems that have marked effects on the health of the building occupants. An increase in repetitive strain injuries by those using computers has been documented. In a survey at the Department of Energy, occupants near windows reported fewer health problems than those who were farther away from windows *(Loftness et al. 1995b, Figure 6)*.

Cost Benefits of Better Workspace

Over the typical 20-year life of a facility, 90 percent of its cost can be attributed to the salaries of the people working there, while only 5 percent is initial construction costs and another 5 percent is operation and maintenance costs *(Federal Facilities Council 1997, p.13)*. On an annual basis, the Center for Building Performance and Diagnostics at Carnegie Mellon University has found that about 78% of an organization's annual operating costs goes for salaries and benefits, while only 8% of total costs are directly attributed to the workspace. These figures show that the greatest opportunity for workplace gains is in improving the performance of the people in the space, not cutting the cost of the workplace. This makes a compelling argument for life-cycle cost analyses that include the effects of workspace on the building population when determining the cost benefit of workspace elements. If the cost of providing important workspace attributes can be shown to provide even a modest increase in productivity,

they can be more easily justified. Conversely, a short-sighted approach of cutting the first cost by providing the wrong kind of space, inadequate space, or installing systems, furniture, and technology that only meet minimum standards and thus hamper work performance, can have disastrous long-term effects. Intuitively, we all know this. The catch is how to quantify these effects in a cost-benefit framework and put them in a language understood by those making the financial decisions. It is up to those who need the particular infrastructure or technology to justify this.

The justification of space improvements to improve productivity was the subject of a study by the GSA Public Buildings Service in which HOK Architects analyzed the cost differentials and payback of traditional and alternative office designs based on the value of increased productivity. Payback for providing more workplace amenities that would increase productivity was shown to range from 2 to 4.3 years depending on the expected level of increase in productivity. This exercise illustrates the life-cycle cost justification for providing workspace alternatives and amenities that increase productivity.

There is some research going on to quantify effects of the workspace on productivity and the bottom line. Carnegie Mellon's Center for Building Performance and Diagnostics and the Advanced Building Systems Integration Consortium (ABSIC) are gathering data from real projects and building a computer model that shows the life-cycle value of specific workplace improvements. They are considering the cost benefits of improvements in seven building infrastructure categories: air, thermal and lighting control, network access, privacy and interaction, ergonomics, and access to the natural environment. Though still in the developmental stage, their study seems to show that the benefits of good workspaces are quantifiable, and they are real. Their conclusion is that the workplace is an integral part of the value creation process for an organization and can no longer be considered a separate overhead item *(ABSIC 1998, Section 6).*

STUDY SUMMARY: REDESIGN OF 800 NORTH CAPITOL STREET

Comparing Costs of Traditional Office Space to Alternative Office Space
HOK Architects, Washington, DC

General Description

Comparison of accommodating changes due to employee churn (which ranges from 30-50% per year in the private sector) between:

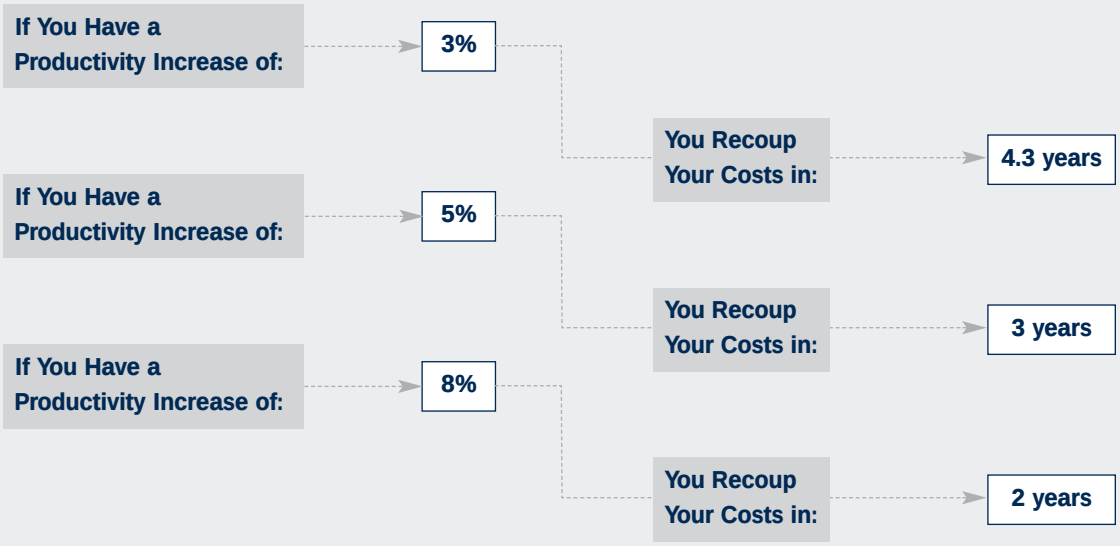
> **Option 1:** A traditional office space scenario of providing incremental space upgrades for 25% of the existing office floor space every year for four years to accommodate change.
>
> **Option 2:** A universal plan scenario of a complete, one-time renovation of the entire space incorporating features of the GSA Public Buildings Service Productive Workplace to accommodate future changes at minimum cost and downtime.

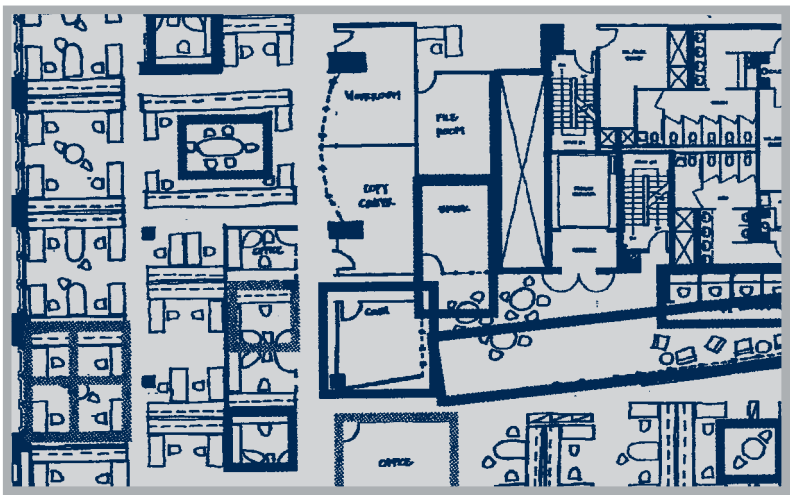
Construction costs are based on an average interior renovation cost of $36.60 per square foot, with no mechanical or electrical building system upgrades. Payback costs are based on 137 employees with an average salary and benefits of $62,500 per year (GS-12) including a 2.5% annual cost increase.

Option 1: Universal Plan Renovation Costs	**$2,425,883**
Option 2: Traditional Plan Renovation Costs	**$1,014,418**
Additional Cost for Universal Plan	**$1,411,465**

Payback on Universal Design

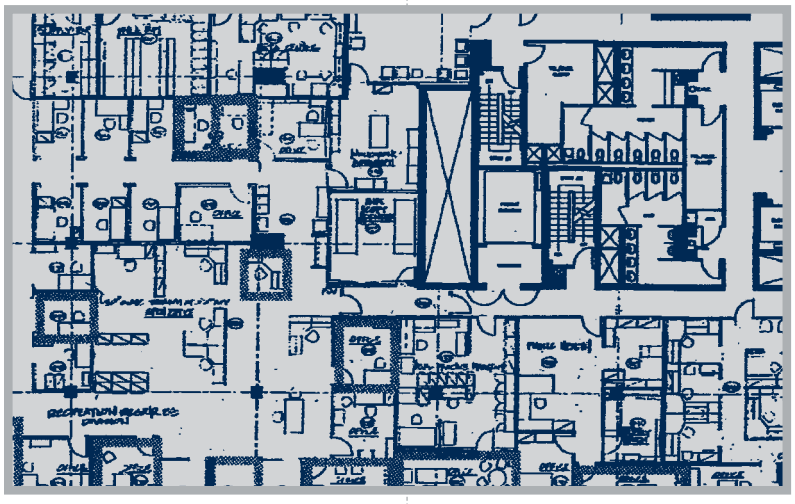
Based on Annual employee Salaries and Benefits above and various levels of increased productivity due to better space and less disruption for changes:





The universal plan redesign for 800 North Capitol Street (top) provides a more flexible option to accommodate future change than the traditional space arrangement (below), and in the hands of a good designer, can provide dynamic workspaces geared to specific tasks.

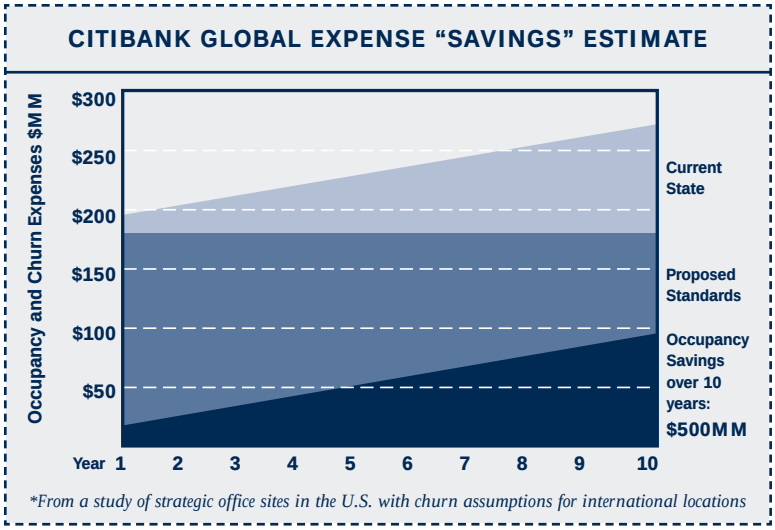
Illustrations by HOK courtesy of GSA Public Buildings Service.



Other research on effects of the workspace on productivity is underway. The American Society of Interior Designers (ASID), in cooperation with private industry and the GSA Public Buildings Service, is conducting a field study to analyze the effects of space renovations on occupant productivity. The Center for the Built Environment at the University of California, Berkeley, is developing better methods to study the effects of workplaces on productivity. Cornell University's International Workplace Studies Program is studying how innovative workplace strategies can improve the effectiveness of individuals, teams, and the organization as a whole.

The Department of Labor Occupational Safety and Health Administration (OSHA) estimates that the cost to U.S. businesses of repetitive strain injuries due to poor workplace ergonomics is between $20 billion to $100 billion annually *(OSHA 1998)*. Estimates from the Lawrence Berkeley National Laboratory of the total amount of productivity gains and savings for U.S. businesses due to better indoor environments range from $29 billion to $168 billion annually *(Fisk & Rosenfeld 1997, p.1)*.

Private sector businesses have reaped savings through reassessment of their real estate needs and use of alternative work environments where appropriate. In rethinking the way they do business and optimizing their space usage, Citibank reduced their space by 23%, reduced churn costs



Citibank expects to save over $500 million dollars in office space costs over the next ten years by instituting new office space standards that mix smaller workstations with shared and special purpose space.

Used with permission of Citibank.

by 76%, and reduced the average cost of each workstation by 20% *(Office of Real Property 1998a)*.

The cost implications of office space improvements for the federal workforce could be significant. In 1997, the non-military Federal payroll and benefits totaled over $158 billion (OPM 1998, p. 60). For each 1% increase in productivity, the Government would realize added value or cost avoidance of more than $1.5 billion. For example, implementing personal environmental controls at the workstation throughout Government would, based on a Johnson Controls Study, would yield a value of $2.25 billion per year. It would not take long to amortize an investment in better space at such rates of return.

What Are the Basic Elements of the Integrated Workplace?

There are three basic elements that should be considered when dealing with the workplace:

1 People: This element includes the individuals who work in an organization, the work processes they use to accomplish the tasks that fulfill the organization's mission, and the culture or working environment that defines that organization. The workplace should foster a culture that is progressive, friendly, tolerant, and motivating. The people and how they work are so intertwined that no categorical distinction between the two is made in this report.

2 Space: This refers to the building infrastructure that houses and supports the occupants and their work. The infrastructure must support the work practices and technology required by the people and provide a place that is safe, inviting, efficient, well maintained, and attractive to a quality workforce.

3 Technology: This includes all the tools that support and enable the individuals to communicate and process information

needed for their work. Technology can be an enabling force in the workplace, if it is appropriate to the work processes and compatible with user and customer needs.

These three elements must be considered together as an interactive whole in order to provide integrated solutions to your workplace needs. Below is a more detailed description of each of these basic Integrated Workplace components.

1. PEOPLE: Management of the Organizational Culture

What Are the Individual Issues and Work Processes Affecting Development of the Integrated Workplace?

The central focus of developing an Integrated Workplace strategy should be the workers and the work they accomplish. The work environment should revolve around what is needed to accomplish the business of the organization from both the individual and group perspectives. The workplace should be centered on the people and how they work rather than on the latest "things" (such as furniture, computers, telephones, etc.) that are available. Selection of the furniture and technology should be driven by the needs of the user and the work processes.

The Integrated Workplace is more about designing for human interaction than it is about delivering finished office space. Moving toward flatter organizational hierarchies, more vertical integration, changes in responsibility, different approaches to status and titles, and examination of compensation alternatives can result in a more participatory, empowered work force. It is these types of human resource issues that need to be supported by the workplace.

A good Integrated Workplace strategy must include careful

Designing for human interaction is the central role of office space.

Courtesy of Owens Corning.

consideration of the people involved and the work being done. People issues are typically far less concrete and much harder to pin down than facilities, finances, and technology. The importance of people and work processes lies in the fact that, ultimately, it is people, as workers, who must use the workplace to translate knowledge into action and provide benefits for the organization. It is people, as customers, who must be satisfied in order for an organization to succeed. People are the users of the workplace, and the purpose of a workplace is to facilitate the business processes used in achieving their goals. Even if a workplace development initiative is primarily driven by financial, technological, or productivity objectives, people's reactions to the workplace can have significant ramifications that control whether these objectives are achieved.

The accomplishment of work is the basic reason for the existence of any workplace; therefore, the impact of the workplace on the work processes is a key consideration. The following categories describe the major people and work process issues, how they relate to the workplace, and why they are important. These areas must be given serious and realistic attention if an Integrated Workplace project is to succeed.

Strategic Objectives

A strategic plan looks at such questions as where an organization is going, how it is trying to get there, and what are the best paths to success *(Steelcase 1997, p.2).* It will include a vision statement, mission definition, goals, and tactical plans (how to achieve the goals). These are the types of issues that an organization should consider when making the decision to change its workplace structure. If your Integrated Workplace project cannot be supported by your strategic plan, you should revisit the reasons for doing it.

Individual User

The individual user is the basic component of the workplace environment. He or she may primarily work alone or in a team environment. In evaluating the individual user, one

must consider factors such as: occupational needs; interpersonal relationships and communications; worker psychological, social, and physical health; perceived and real status and rank; workplace privacy; sense of control over one's immediate environment; quality of work life (morale, level of energy, commitment, job flexibility, ability to concentrate, family-friendliness, job satisfaction, etc.); promotion potential; workplace comfort; teamwork and collaboration; and work-related values. Remember too, that the manager is also a user. Issues such as management style, worker expectations, informal and real status within the organization, and their impact on the Integrated Workplace should be considered.

Organizational Culture

In discussing strategies for the Integrated Workplace, it is important to consider the role of organizational culture. Organizational culture is a loosely defined concept that covers an extremely broad subject. For this discussion, we are referring generally to organizational characteristics such as shared work values; formal and informal practices, policies, ideas, and expectations involved in an organized workplace; ways of communicating and relating; and ways of getting work done.

Since the Integrated Workplace will require changing the organization, it is essential to understand this culture and to understand how decisions are made *(Sims/Joroff/ Becker 1996, p.45)*. Items that need to be addressed are: understanding what motivates staff and management, clarifying how employees are assessed, and exploring the process of organizational change within the company and the affected business units. It is important to look at the organization's experience of change efforts. This will help reinforce current change efforts, so that successful approaches will be developed and mistakes made in the past will not be repeated *(Sims/Joroff/Becker 1996, p.45)*.

"You don't get an office. You get cargo pants."

Work Processes

Work processes are the way work gets done to achieve desired outcomes that support the mission and goals of an organization. These processes could range from entering data in a building inventory system to developing an agency strategic plan. One can view the process at both the individual and organizational levels. Issues to consider are job performance, work habits (availability, reliability), teamwork (if appropriate), effectiveness of communication and interpersonal relationships, customer service, and productivity. Work processes are dynamic, and can often take place in different locations. It is important to identify which locations and strategies will best support particular processes. The types of alternatives that can support work are described below.

Alternative Officing

In planning for the Integrated Workplace, it is important to consider the variety of options available in which to perform the work. According to Lois Bennett, a space planning expert with the GSA Public Buildings Service, alternative officing is a process of determining how, when, and where people work and then matching these needs to the range of work environment solutions *(Office of Real Property 1998a)*. Some of these options may not require a person to come in to the central office location on a daily basis (off-premise arrangements). Other alternative officing strategies make innovative use of existing office space (on-premise arrangements). Some of these alternative officing strategy options are:

On-Premises:

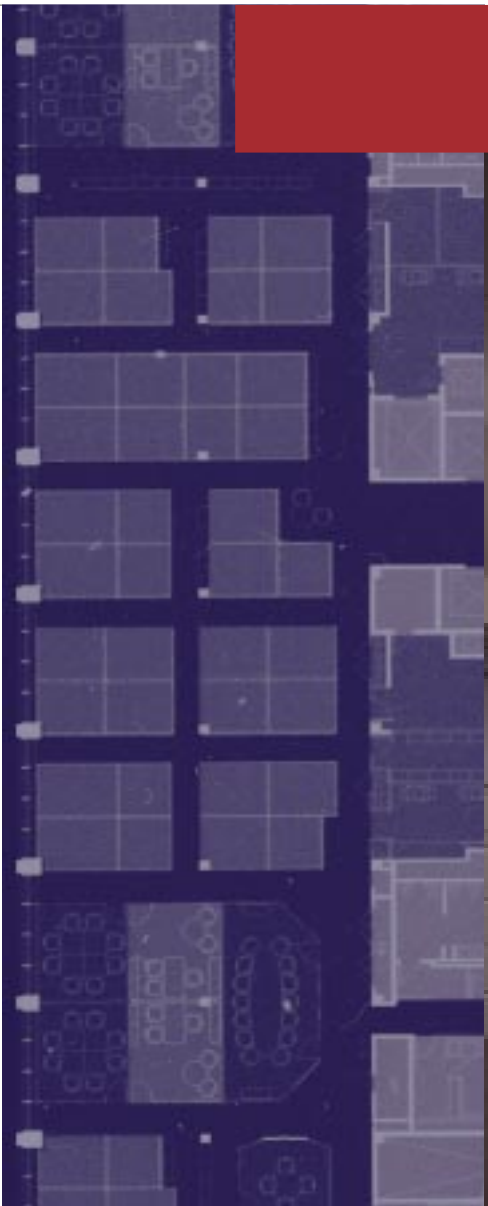
> HOTELING – Employees call to reserve workspace in the main office, where there are fewer offices than staff.

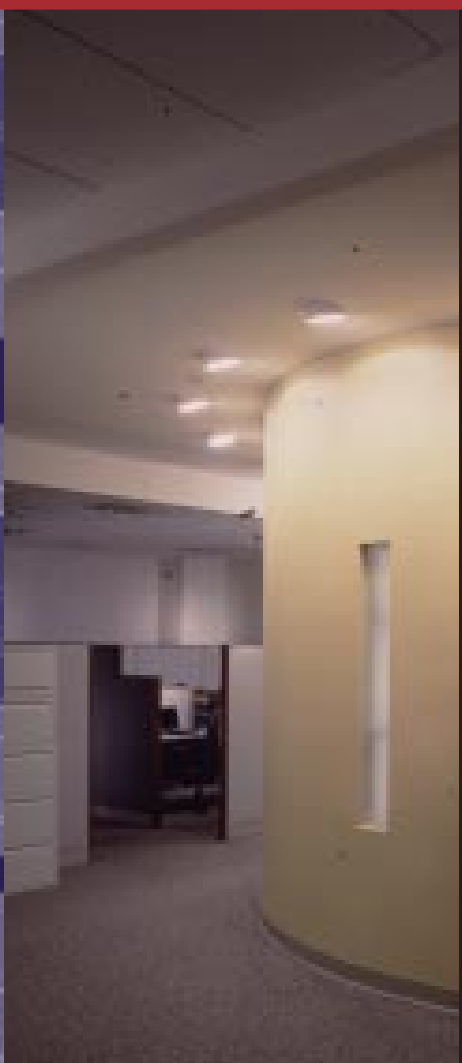
THE INTEGRATED workplace

3

case study

Manor Care Corporate Headquarters





Manor Care Corporate Headquarters

Gaithersburg, Maryland

Occupants

Manor Care Corporation

Design

Greenwell Goetz Architects

Contact

Navlet Robinson, Building Services Manager, 301 979-4000

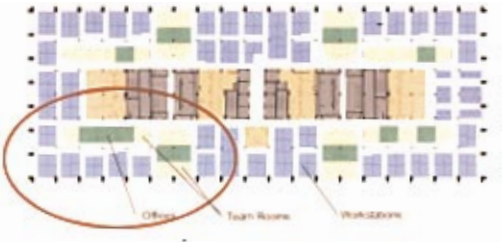
Project Background

This case study is a good example of a top-down, conservative-management-style company that made enormous and dramatic cultural workplace changes to become better integrated and to function more efficiently.

The campus-like setting of Manor Care's Corporate Headquarters Building in Gaithersburg, Maryland, was formerly used by the National Geographic Society. Located on approximately 110 landscaped acres, complete with gardens and a 13-acre lake, the 340,000-square-foot, six-story headquarters building was designed as an open office facility to increase interpersonal communication, flexibility, and employee visibility.

Prior to the move, Manor Care was located in three separate buildings in Silver Spring, Maryland. By combining all of the operations into a single building with a large, 56,000-square-foot floor plate, Manor Care was able to reduce its operating costs and remain functional during the transition to the new facility. All of the accounting, billing, cost estimating, and employee benefits divisions are grouped together on a single floor; with similar groups physically located near one another.

Each floor has four connecting hallways, with two banks of elevators and two sets of restrooms. Team rooms are located at the ends of the hallways, with conference rooms on each side of the two elevator lobbies.



Integrated Workplace Concepts Employed

People

> Changing from private offices to open-plan offices was crucial in making the management strategy work.

> To help employees adapt to an open-plan office culture, management instituted flextime hours, changed to a casual dress code, started an educational program, and provided exercise facilities and a cafeteria.

> To accommodate a flextime work schedule, Manor Care extended business-hour HVAC operation from eight hours per day to twelve.

> A workstation mock-up was provided before the move to help people adjust to the new open-plan arrangement. Initially there was great resistance, but over time people have adapted to the new environment and come to accept it.

Space

> Universal planning was applied to much of the building, with open-plan workstations, and conference and teaming rooms on each floor.

> Employees who work with sensitive issues use the few remaining private offices, located at the building's interior. They have glass partitions to maintain openness and get natural light from the open office areas.

Technology

> The building LAN connects each workstation.

> Teaming areas and conference rooms have multiple docking stations and computers.

> Facilities are provided for satellite videoconferencing.

> Sound masking is used in busy areas.

Project Results

(best practices, lessons learned, benefits gained)

> Consolidating all the staff from three buildings into one building resulted in a reduction of the total space needed, mainly due to the reduction in common space duplicated in the original three buildings. Productivity has increased and operating expenses have decreased.

> By studying the adjacencies, coordinating with groups that needed to work with each other, and utilizing universal planning concepts, the new teaming concept is working well. Reducing the number of private offices and increasing the number of open-plan workstations was critical to promote more employee interaction.

> Changing the culture in the workplace is very difficult, and sometimes requires strong leadership and top-down decisions to move change along.

> Since many employees were giving up private offices for open work-stations half the size, the occupants who first moved into the building were given amenity options, such as different work surfaces and colors in their workstations to suit individual work styles. However this did not improve the transition to the new work environment as expected, and was discontinued on the upper floors. This points out the need for maximum employee involvement during the design process.

> Time was the greatest factor in helping the employees accept the change from private offices to open-plan workstations. The Transition Team began educating employees six months before the move. This provided the opportunity for employees to state their concerns and provide feedback on the typical workstation design.

> Reusing the existing HVAC system, with its single zone per floor and lack of control, has resulted in a loss of flexibility in encouraging after-hours work and a possible loss of some potential for additional productivity gains and reduced operating costs. However, extending the HVAC operating hours and instituting a flextime policy helped compensate to some degree for the inflexible mechanical system.

All images courtesy of Greenwell Goetz Architects.

Privacy space is located adjacent to the break area at the Steelcase Corporate Headquarters in Grand Rapids, Michigan.

Courtesy of Steelcase North America.

- MOTELING – Employees check in upon arrival and are assigned a workspace with no advance "reservations."
- SHARED SPACE – Two or more employees use a single workspace permanently assigned to them. Employees must work together to determine when they each can use the space.
- CAVES AND COMMONS/ PRIVACY SPACE – Individual workspace is provided for tasks requiring high levels of concentration, and common, community space areas are provided for team activities, like gatherings and conversations.
- FREE ADDRESS – A mix of unassigned private and open-plan offices and team and retreat areas are combined in one large integrated space.
- HOME BASE – An arrangement where an employee has a permanent office or workstation, as well as a workspace with another group where they work on a specific project assignment.
- RELIEF SPACE – Here, employees can interact with other employees to generate spontaneous or creative problem solving.
- TEAM OR GROUP ADDRESS/ CO-LOCATION – This work environment is designated for use by a specific project team for the duration of a project.
- CONFERENCE/MULTIMEDIA SPACES – Special communication and presentation facilities that are provided in a separate space.

Off-Premises:

- TELEWORKING/TELECOMMUTING – Employees work at home, at an alternate work facility, or in a "virtual" environment at least part-time.
- SATELLITE OFFICES AND TELECENTERS – Alternate work facilities are located nearer to employees' homes. Satellite offices are typically operated by and for a single employer, while telecenters operate independently and are used by numerous employers.

Steelcase's high-tech conference center has full multi-site teleconferencing capability with individual connectivity at work stations throughout the space.

Courtesy of Steelcase North America.

> "VIRTUAL OFFICE"– Employees are equipped with the tools, technology, and skills to perform their jobs from anywhere, including home, office, customer location, or in transit.

Maintaining Community

Employees moving into alternative workplaces may fear that they will be seen as less a part of the organization *(Sims/Joroff/Becker 1996, p. 18)*. This concern is also exacerbated by the increased pace of Federal downsizing and restructuring that has been so prevalent in the past few years. There must be comprehensive managerial and workplace support that responds to these new ways of working and will dispel these fears. Therefore, there must be a broad managerial effort to keep employees informed about their organization.

Analyzing Current Work Patterns

The organization must look at the type of work being performed and the space requirements for that work. Do your positions require intense individual work, team work, and/or "knowledge work?" "Knowledge work" requires analyzing information, but it also requires face-to-face access to other people. Can the work be performed on-site, off-site, or a combination of the two?

Human Resources Management

Human resources issues focus on recruitment and retention of employees, union considerations, worker expectations, workplace conditions and environment, and equal opportunity and diversity, and their impact on the Integrated Workplace. Listed below are the major issues which must be addressed, with union representation (if applicable), to assure that the Integrated Workplace project will meet user's needs and expectations and will proceed without significant delays.

Staff Profile

It is important to know the makeup of your organization's staff. Where do they live in relation to the customer base and what is their demographic makeup (age, percentage of people with young children, dual income families), etc.?

These characteristics are going to affect the workforce's ideas

about what constitutes a decent job, a reasonable commute, a comfortable office, acceptable supervision, and rewarding ways to communicate *(Sims/Joroff/Becker 1996, p.50)*. The Integrated Workplace must take these factors into account in order to be an organization that is going to attract and retain top people.

Training and Skills

Will the workforce have the skills to work in the new workplace? Will changes cause skill shortages in certain areas? The new workspace may create a need for new knowledge, skills, and abilities among the affected workers. For example, in alternate work site programs, employees may need to boost their computer literacy. They may also need more technical support. Some of these new needs can be handled by training, while others may require different employees with the appropriate skills.

Change Management

Change management is probably the most important activity for workplace implementation. Like organizational culture, change management is a loosely defined term referring to a very broad array of activities. For this discussion, we will focus on change management as the activities designed to help the people and their work adjust to the changing workplace.

A number of important and effective change management practices have been identified by corporate and real estate managers *(Sims/Joroff/Becker 1996, pp.64-66)*. These include:

> Communicating the change, how it will occur, why it is necessary, and information on progress.

Flexible meeting space is a key component of group communications.

Courtesy of Steelcase North America.

A variety of workspace options, including individual and collaborative areas, are features of the Army's D. L. Stone Education Center at Fort Lewis, Washington.

Courtesy of Haworth Inc.

> Discussing employee concerns, such as performance assessment, career development, technical competency (do they have adequate skills for the change?), work and family issues, and other similar concerns that require employee reassurance.

> Distinguishing between resisters and skeptics. Resisters are people who actively oppose change and may actually try to sabotage new processes. Skeptics are people who are just not sure how change will affect them and how they can deal with it. Many times, it is often not possible to win resisters over. But with proper support and a clear justification of need, the skeptics are likely to accept and eventually champion the Integrated Workplace.

> Involving employees in planning and design to provide greater commitment to the project.

> Offering employees options that provide both central and local control. This will give individuals the ability to establish their own protocols, such as scheduling and setup of project rooms, methods of team communication, how and when people can work in an alternative location, etc.

Changing Expectations

Another factor integral to change management is the need for both management and staff to change their expectations and attitudes about the nature of work and what work should be accomplished at various locations, such as telework centers, at home, in team areas, or at a customer's location *(Becker & Steele 1995, p. 146)*. When people are in the central office, they may be talking with each other, sharing information, and catching up on news, instead of working at a computer or being in a scheduled meeting. Such scenarios should be considered real work, not time out. If management makes employees feel uncomfortable working in

these alternative environments, they will not be used, and any benefit to the organization will be lost.

Change Agents

Change agents are individuals who, for a variety of reasons, possess the ability to facilitate organizational change. Obviously, such individuals can be useful to workplace development implementation efforts. Roles for key change agents include communicating, troubleshooting, and participating in change management activities.

There are two types of change agents that provide the leadership for the Integrated Workplace effort:"Visionaries" and "implementers" *(Becker & Joroff 1995a, p. 35)*. Visionary leaders help create a sense that there is an urgent need for change at all levels of the organization. They demonstrate in their own work patterns a commitment to better ways of working.

The "implementer" acts somewhat as a project manager to coordinate the implementation of the Integrated Workplace effort. He or she acts as a liaison between the "visionaries" and the employees. The primary goal of this person must be to ensure that the implemented change meets the needs of the employees while supporting the other project goals. This person is able to build commitment from both above and below, delegate responsibility, communicate ideas clearly, and translate a concept into a working plan. He or she must be strongly committed to the Integrated Workplace effort and must understand the implications that such a change will have on the organization. In addition, this person must have senior management's complete confidence and support.

Transition Management

Transition management is the subset of change management that focuses on activities to help people cope with changes and disruption during the move from the existing to the new workspace. Some examples of transition issues are:

> Maintaining the work flow

> Dealing with the temporary nature of things

- Coping with delays and uncertainty
- Finding substitutes for normal resources
- Surviving disruptions and/or discomfort
- Managing interpersonal tensions
- Withstanding performance changes
- Minimizing interruptions of social, team, and collaboration habits
- Minimizing breakdowns and communications difficulties

Some suggested activities to deal with these transition issues are:

- Assessing the transition impact and discussing it with the staff
- Emphasizing patience and tolerance and providing support
- Troubleshooting potential problems
- Making contingency plans to deal with possible disruptions in services
- Providing current information to employees
- Rewarding cooperation with real changes

Change Management — Beyond the Transition

Clearly, after the transition, there will be both long- and short-term changes that may become permanent as a result of the new workplace implementation. Such changes can affect any aspect of the people's work processes. With that in mind, selection of change management activities should be focused on permanent and successful adjustment to the new workplace. Communication about the new workplace is a key aspect of change management. Support mechanisms, training, and policies or procedures designed to encourage adjustment should be developed and implemented. Change agents and other participants should be deployed to work with this effort. Suggested activities include:

- Establishing a quick response team to troubleshoot plans and deal with problems.
- Testing and implementing all new policies and procedures reflecting the changes.

- Setting up support mechanisms focusing on the change areas and maintaining them as long as needed.
- Considering the use of professional change managers to handle some or all of the issues.
- Conveying in word and action that management is seriously committed to the change, properly leading it, and properly supporting it. It is also important that there be no commitment gap between top and middle management and that management lead by example.

In job or work process restructuring, affected employees should be informed as soon as possible. It is important to have adequate support mechanisms in place as well as procedures to relieve negative or anxious reactions that may spill over into other aspects of the organization's adjustment process. These mechanisms should be set up and ready to go BEFORE any announcements are made. Obviously, in an environment in which employees are anxious about changes, it is unrealistic to expect them to be able to focus and prepare themselves for working in a new way.

Information provided to the employees should communicate not only the general background about why the change is taking place and what are the expected goals, but also the personal implications of the changes on the employees (e.g., location of their workstations, changes to phone systems, supply and mail handling, storage systems, and who will be located near them). Information should convey an understanding of the following:

- Why the workplace change is occurring
- What is involved in the workplace change
- The short- and long-term goals of the change
- The likely people and work process impacts of the change
- How the change will affect the individual

In addition, change communication should deal with the misinformation, rumors, and myths that are common companions to change. It should document how the new workplace fits into strategic plans, mission goals, cultural emphases, and tactical plans, both short- and long-term.

Common Mistakes

Below are listed some common mistakes to avoid in management of workplace change.

- Try to avoid "hype" and "hype" terminology. The communication should be reality-based, straightforward, and honest. Focus on bread-and-butter issues that are likely to concern the various groups of people involved.
- Don't rely solely on formal presentations and written materials. Often, less formal, impromptu discussions will be more productive in conveying new ideas.
- Don't assume that since you've "told them already," you don't need to repeat and reinforce the message.
- Don't assume that change management starts with move-in and stops after it. It begins when the project begins and continues after occupancy. Ideally, it will be an ongoing process.
- Don't focus on the physical design and technology and short-circuit the cultural issues. Involving staff in the design process is not the same as involving them in a long-term cultural change process.

The Domino Effect

There is typically a lot of interaction and interdependence between people and work factors. If you change one thing, it causes changes in others. Moreover, workplace changes can create new requirements for the organization. For example, an organization that introduces desk sharing will also have to deal with a whole new array of interpersonal relationships and associated policies and procedures. Perhaps there may be more challenges for employee assistance programs or family friendly programs.

Other domino effects include impacts on the distribution of

resources, support, and staff and performance management issues (such as job descriptions and expectations).

Dealing with Potential Obstacles

The implementation plan should anticipate and have mechanisms in place to deal with a variety of obstacles that show up. The mere passage of time, while the planning is underway, can lead to obstacles such as changes in important work factors (such as harmonious relationships) that were in place when design decisions were made. Also be prepared for the "wet feet" syndrome: changes in personnel (especially managers) and responses once the project gets "real." Other potential obstacles include lack of clear objectives; weak endorsement by management; inadequate training and orientation; token user participation; and insufficient administrative and technological support. Finally, a key obstacle is the gap that often occurs between top management decisions and middle management acceptance and commitment to the project.

2. SPACE: The Supporting Office Infrastructure

What Type of Infrastructure Is Needed to Support Changing Organizational Needs?

The term *infrastructure* as used in this report means all the elements of the built environment that support the building inhabitants. Many of today's Federal workers do not enjoy the benefits of first-class infrastructure. While it may have been "state-of-the-art" when first built, much Federal space has become outdated. Perhaps this is due to insufficient funding or to the attitude that maintaining high-quality office space is not essential to accomplishing Federal programs and is not in the best interest of the American taxpayer.

If this attitude still exists, it needs to change. Current knowledge and design practice reinforce the idea that good space will benefit employee satisfaction, morale, and productivity and will help attract and retain valued people.
This is consistent with Federal standards and guidelines that call for Federal workspace to be modern and efficient.

Traditional Federal Government office space.

Courtesy of GSA Office of Governmentwide Policy, Office of Real Property.

Monotonous rows of "cubicles" to maximize space do little to support group interaction and communication or create a sense of place. Perhaps this type of space is no longer "good enough for government work."

Courtesy of GSA Office of Governmentwide Policy, Office of Real Property.

Considering these facts, and the reality that Federal workers are now being asked to meet private sector benchmarks, it should be clear that much of our current Federal workspace is no longer "good enough for Government work."

Public laws, regulations, and guidelines set high standards for Federal space. The Federal Property Management Regulations *(Section 101-19.002)*, which apply to GSA and agencies operating under a delegation of authority from the GSA Administrator, state:

> **(g)** *The design of new buildings and their appurtenances should provide efficient and economical facilities in an architecture of distinction and quality. The architecture should reflect the dignity, enterprise, vigor, and stability of the United States Government. The designs shall embody the finest contemporary American architectural thought and shall respect local architectural characteristics.*

> **(k)** *In the design of new public buildings and alterations to public buildings, the objectives of nationally recognized building and performance codes, standards, and specifications will be met and amplified according to the needs of GSA and as necessary to conform with the accident and fire prevention policy objectives stated in Sec. 101-20.109-1. In addition, special features of local codes directly related to local circumstances or practices will be, to the maximum extent practical, incorporated into the design.*

Clearly, Federal facilities should be of at least comparable quality to those in the private sector. Considering that they are meant to be owned and operated significantly longer than commercial buildings, the argument can be made that Federal building infrastructure should be of higher quality than that in the private sector. The design and value of Federal facilities, whether owned or leased, should also

be considered from a life-cycle and value-added perspective rather than just first cost.

Federal agencies that build and alter space must, in addition to supporting their current tenants' missions, anticipate and provide for future changes in business processes and technology to serve the tenant agencies as they evolve. This is probably the most important building feature to provide: the ability to facilitate future changes with the minimum cost and disruption to operations. According to Dr. Leonard Kruk, this is called "future-proofing" your facilities (World Workplace 1997, p.579). The longer a building is expected to last, the more important this flexibility to accommodate change becomes.

Just as your organization's plan for office space should be approached comprehensively, so should the building components be considered from a comprehensive, integrated systems perspective. In this way, conflicts in office support systems, such as communications, power, and information technologies that compete for space, can be minimized, thereby reducing costs and maximizing flexibility.

A flexible, integrated approach to building systems at the Robert L. Preger Intelligent Workplace in Pittsburgh will assure high performance and the ability to accommodate inevitable change.

Courtesy of Center for Building Performance and Diagnostics, Carnegie Mellon University.

A brief description of building systems and the major features of space design follow.

Building Systems

Systems that support the occupants must be able to adapt to changing requirements and future technology. Below are descriptions and considerations for each of the major building systems: structural, mechanical (heating, ventilation, and air conditioning and plumbing), and electrical (power, lighting, telephone and communications). The relationship of particular building systems and features to each of the Hallmarks of the Productive Workplace defined in Chapter 3 is shown in the accompanying Workplace Productivity Matrix,

WORKPLACE PRODUCTIVITY MATRIX

Relationship of Building Systems/Features to Hallmarks of Productivity

Key:
1 = Least Importance
3 = Greatest Importance

Systems & Features	HALLMARKS OF PRODUCTIVITY						
	Spacial Equity	Health	Flexible and Convertible	Comfort	Technology/Connectivity	Reliability	Sense of Place
Foundations	1	1	1	1	1	2	1
Substructure	1	1	1	1	1	2	1
Exterior Closure	1	2	1	3	1	1	3
Roofing	1	2	1	1	1	1	1
Interior Construction							
Partitions	3	3	3	2	3	2	3
Interior Finishes	2	3	1	2	1	1	3
Furniture	3	2	3	3	3	1	3
Specialties	1	1	2	1	1	1	2
Mechanical							
Plumbing	1	2	2	2	1	3	2
HVAC	2	3	3	3	2	3	3
Fire Protection	1	1	2	1	1	3	1
BAS/Special Systems	1	3	3	3	2	3	1
Conveyance Systems	1	1	1	1	1	3	2
Electrical							
Service and Distribution	3	1	2	1	3	3	1
Lighting and Power	3	3	3	2	3	3	2
Telecommunications	3	2	3	2	3	3	2
Fire Detection/Suppression Systems	1	1	2	1	1	2	1
Other Special Systems	2	1	2	1	2	2	1
Equipment							
Food Service/Vending	1	2	1	2	1	2	3
Artwork	1	1	1	1	1	1	3
Client Process Equipment	1	2	1	1	1	2	1
Site Work	1	1	1	2	1	1	3
Transportation	1	1	1	1	1	1	2

Source: HDR Architects courtesy of GSA Public Buildings Service

developed by the GSA Public Buildings Service and HDR Architects. The importance of the relationship is ranked from the weakest, indicated by a 1, to the strongest, indicated by a 3.

Structural

The building structure includes the structural system (foundations, columns, beams, walls, and floors), building enclosure (walls, windows, roof, and doors), and interior partitions and other permanent features. These are the elements that provide the framework, the "place" that houses all your office functions.

New structures can add flexibility by incorporating additional floor-to-ceiling height that accommodates conventional raised or underfloor utility distribution systems and large column spacing that will not interfere with the interior layout. Generally, existing buildings provide less flexibility, but experienced designers can provide new solutions to make renovated spaces work with new office practices and technology through the use of alternative raised floor systems that can be less than two inches high.

Mechanical

Heating, Ventilating, and Air Conditioning (HVAC)

HVAC systems keep the building occupants comfortable and supplied with fresh, conditioned air. Unfortunately, more often than not, existing systems that were poorly designed or installed, or that are poorly maintained, don't do this—at least not to the satisfaction of many occupants. Being too warm, too cold, or too stuffy are the most common complaints of building users, according to surveys by both the Building Owners and Managers Association (BOMA) and the General Services Administration Public Buildings Service.

Your mechanical engineers should design building systems to not only meet all minimum codes and standards, but more importantly, to meet user requirements. These user requirements often exceed the code and guideline minimums and should be reflected in the design.

The Johnson Controls Supplied Air Personal Environments® system provides user control of temperature and airflow at the individual workstation, addressing the biggest complaint of office users – lack of thermal comfort.

Courtesy of Johnson Controls Inc.

Offices with smaller ventilation zones can better meet specific needs, including temperature, air quality, and volume control. It may be a pleasant 70 F degrees on the office thermostat, but if there's a cold draft blowing on you, or you are sitting next to an exterior wall that is radiating summer heat, you won't be comfortable.

Personal control of HVAC systems in modern office buildings has been the toughest issue. The systems themselves can be expensive, and energy conservation and budget goals often conflict with the desire for better individual controls. Solutions include newly developed individual workstation ventilation systems, underfloor low-pressure distribution systems with user-adjustable floor diffusers, or such "novel" features as operable windows to take advantage of natural ventilation when appropriate.

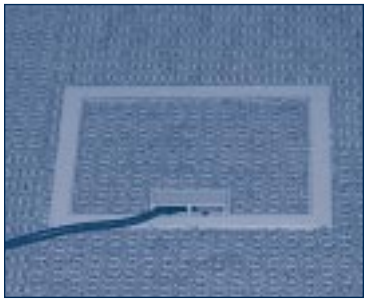
Plumbing

Beyond the basic health and safety needs of everyday life, like toilets and fire-suppression systems, building plumbing systems support special areas like janitors' closets, break areas, laboratories, and locker rooms. While more limited than most building systems, water and waste piping distribution can be made more flexible by designing vertical and horizontal plumbing chases to allow for changes in layouts and use of space that minimize occupant disruptions.

Electrical

Building and Workplace Power

Your electrical engineer should consider both the amount of power required to support building and tenant functions, and how it is distributed throughout the building. The design will include dedicated emergency systems (often connected to emergency generators or a second feeder), normal building support loads, tenant office, and special loads.



Access floor workstation modules by AMP Inc. provide power, data, voice, and fiber connections in any location.

Courtesy of Center for Building Performance and Diagnostics, Carnegie Mellon University.

In their discussion of how to provide for constantly changing office needs *(Cooper and Silver 1997, p. 173)*, Walter Cooper and Kenneth Silver observe that:

> Today's typical office standard of 5 to 6 watts per square foot is likely double the needed size and, in the future, may become as much as four times too high.

> Oversizing the building electrical supply increases installation and operating costs for both the power and the cooling systems.

As centralized computer systems are dispersed throughout facilities, dedicated data closets with auxiliary cooling and power will likely be needed. At their World Headquarters in Toledo, Ohio, Owens Corning created a fully interconnected system featuring a global network that replaced 200 separate systems. Since almost 70% of the building users used laptop computers, the system was designed to allow them to plug in and use the system anywhere in the facility *(See Case Study Number 4)*.

Electrical systems must be designed to be flexible within the spaces and have the capacity to be modified to accommodate future needs. Electrical connections of sufficient number and capacity must be available throughout the workspaces. In addition to flexibility, considerations should include the quality, reliability, availability of power, and backup and alternative power sources that can best meet the tenant's special needs.

Lighting

A productive workplace requires the right lighting. Good lighting design considers not only the amount of light, but also the quality of the light, including its color and lack of glare. It is best accomplished by a lighting designer who will work with your electrical engineer to provide the best quality of illumination for all your needs. Interior lighting can be divided into ambient lighting that provides general illumination for an area, and task lighting that illuminates specific areas or objects, such as the desktop, artwork, or a display wall.

Plug-and-play systems simplify wiring changes and reduce reconfiguration costs.

Courtesy of GSA Office of Governmentwide Policy, Office of Real Property.

The heart of the plug-and-play system is the satellite closet, where connections can be rerouted and equipment monitored.

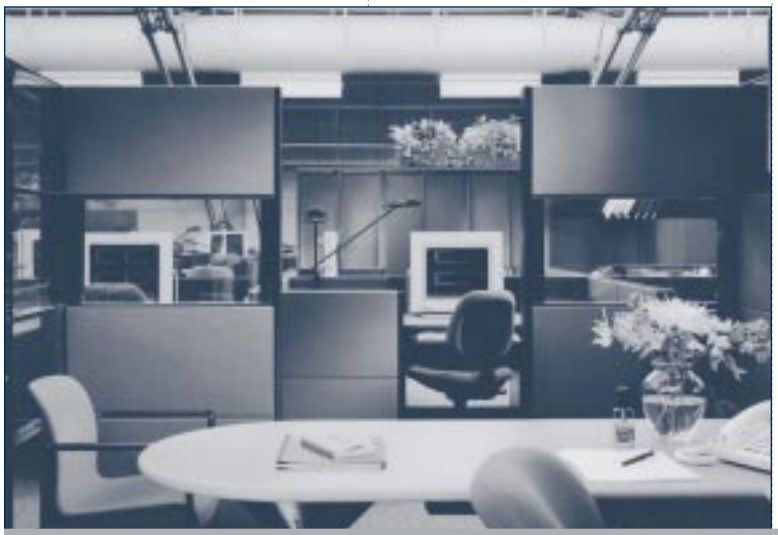
Courtesy of GSA Office of Governmentwide Policy, Office of Real Property.

Ambient lighting is generally low-level light, providing the minimum required illumination for overall safety and visibility in the building. In the past it has generally been direct (i.e., in an overhead ceiling system), but many new offices are providing less harsh, indirect ambient lighting with furniture or pendant-supported lights that reduce glare on work surfaces and computer screens.

Task lighting is usually controlled by the individual user and supplements the ambient building lighting to provide the higher levels of illumination needed for specific tasks. Most often, fixtures are provided within workstation systems, furnishing lighting at the work surface for the individual user. Daylight should be provided to all occupants and integrated, where possible, into the building's ambient and task-lighting systems to provide more pleasing workspaces and to reduce energy costs.

A combination of ambient and task lighting, supplemented where possible by daylight through transparent panels, is essential for good worker performance and energy conservation.

Courtesy of Herman Miller Inc.



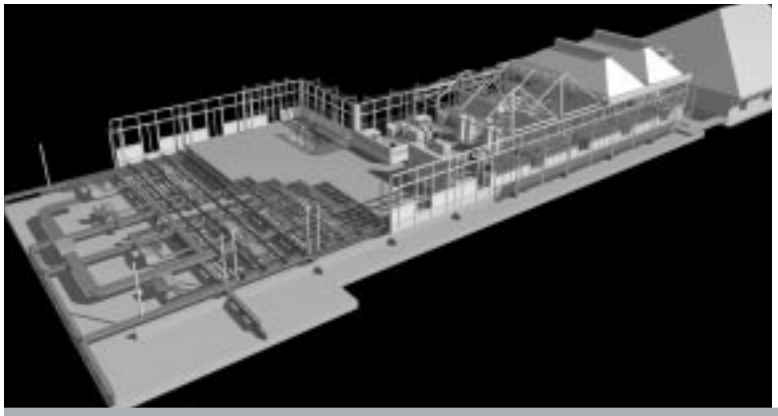
Building Communications Systems: Voice, Data, And Video

The core of your office is probably the distribution network that supports occupant telephone, computer, and video systems. Specialty consultants should consider existing and new technologies, attributes such as external connectivity, control centers, and vertical and horizontal distribution.

Connectivity to the outside world is provided by satellite dishes, microwave, fiber optics, and telephone lines. Internal distribution of utilities may be through multiple chases serving smaller floor areas or from one central core. Multiple chases allow shorter horizontal distribution runs and give more flexibility to space use and reconfiguration.

Horizontal distribution is made either through the space above dropped ceilings (serving the floor above or below), under raised flooring, or in the floor structure itself. Floor distribution, especially when it is integral to the structural system, can provide great advantages in flexibility and, if combined with mechanical systems, can actually reduce the amount of horizontal circulation space required for utilities *(Loftness et al. 1995a, p. 96).*

Distribution networks connecting equipment closets and workstations will have a significant impact on the occupied space. Each of the basic types of cabling—workstation, riser, and, in the case of multiple buildings, plant cabling—must be planned into the physical space. The Telecommunications Industry Association (TIA) recommends a minimum of one closet per floor and a minimum of one closet of at least 70 square feet for each 10,000 square feet of floor space. Even more space may be required in a multi-vendor/multi-technology environment *(FacilitiesNet 1998)*.



Robust horizontal and vertical distribution networks, such as these at Carnegie Mellon University in Pittsburgh, are critical to accommodate rapidly changing environments and technology.

Courtesy of Center for Building Performance and Diagnostics, Carnegie Mellon University.

Accommodating technology in historic buildings is a challenge. Be careful not to degrade the quality of your space while trying to upgrade the quality of your infrastructure.

Courtesy of GSA Office of Governmentwide Policy, Office of Real Property.

Cooper and Silver also discuss distribution system impact on building infrastructure, including wiring for power, data, and building-controls systems. Where networks extend from floor to floor, multiple risers are needed and space must be set aside for multiple WAN systems and vendors. They describe and critique the major types of distribution systems *(Cooper and Silver 1997, p.173)*:

"Hardwired" systems are those where individual workstations are connected to a telecommunications closet by an uninterrupted length of cable.

> This is the least flexible and most cumbersome system, using a considerable amount of space for "home-run" cabling.

"Zoned" systems are where workstations are clustered in groups of up to about 25, with server boxes arranged on a grid beneath an access floor. Only the boxes are connected to the telecommunications closet, thereby reducing cabling.

> Zoned underfloor systems do not allow moving a user's computer or telephone from one location to another by simply plugging from one set of outlets to another, but must be reconfigured with each move.

> Distribution boxes need to be accessible on a routine basis, making this system unsuited for use above ceilings or mounted to walls.

> The greater number of connection points in a zoned system can make changes and problem tracing more difficult to track.

> LANs cannot accommodate much movement of computer equipment because of limitations in the way networks are structured. Office administrators discourage portability because it increases equipment maintenance and reconfiguration costs.

"Wireless" technologies provide connections with no tether to the equipment.

> They allow computers and telephones to be portable, suggesting a great degree of office flexibility.

- These systems are generally more suited for use outside of the office than inside since their significantly slower (relative to wired systems) data-transmission capabilities limit their usefulness.
- Where a high need for portability and mobility is coupled with a relatively low data demand, such as in a convention center or in utility areas, they can be useful.
- Where the mobility of wireless outweighs its disadvantages, provision must be made for an above-ceiling "grid" of antennas and wire pathways to service those antennas.
- Another restriction is the limited range of radio frequency and infrared spectrum needed for the system, which, once it is exhausted, slows down or stops the system altogether. This "headroom" problem is exacerbated by airborne signal encryption requirements.
- Where workstations require hard wiring for power and task lighting, wireless communication does little to augment flexibility. It may actually complicate space changes because system performance is affected by furniture and wall locations.
- Wireless systems also have an impact on the facility's exterior where antennas must be located.

"Plug-and-Play" networks allow computer and telephone network access from any desk.

- Such systems may be enhanced by wireless communications, but may suffer from the same limitations. Like the all-wireless systems, they fail to offer technical and data handling capabilities that most employees would find acceptable in an office setting.
- At present, initial cost and technical limitations preclude widespread use of such systems.

There are several wire handling options.

A low-profile access floor system provides wiring and HVAC needs to all workstations at the Pennsylvania Department of Environmental Protection's Southcentral Regional Headquarters Building in Harrisburg. The outlet boxes and floor-mounted air diffusers can be located anywhere within the workstation to suit individual needs for connectivity and comfort.

Courtesy of GSA Office of Governmentwide Policy, Office of Real Property.

> "Poke-through" wire handling is a logical extension of the traditional electrical distribution system, where users are served through a floor penetration, by a system located in the ceiling of the floor below. It is best suited to spaces with low device density, such as a lobby, since it is difficult to relocate penetrations and patch them, and each hole through the slab can affect the building's structural integrity.

> Ceiling and wall-based distribution systems are the most commonly used systems. While not particularly flexible or attractive, they may be the most economical in the short run since they provide enough space for a large number of cables and large bending radii of copper cable and optical fiber. Their use of support trays with access boxes at frequent intervals allows the cable to be moved with less frequent damage. Typically, cable trays are located in halls with conduit stub-ups from workstation outlet boxes. While this system does provide flexibility and large capacity, tracing problem cabling and maintaining a clear space above the ceiling can be a problem.

> Access flooring is used extensively in main computer rooms for electrical, data, and conditioned air distribution. Today's thinner access-floor tiles and thinner system wires allow the use of floors as little as 1½ inches high for wire distribution. In Europe, access floors as low as six inches are commonly being used for office ventilation, as well. When using access flooring, transitions to other building elements such as ramps, elevator offsets, and slab depressions must be accommodated.

Indoor Environmental Quality

There is no doubt that the indoor environment affects behavior. According to studies summarized by Carnegie Mellon University, space temperature and the lower oxygen levels associated with poor ventilation directly affect such things as manual dexterity and cognitive productivity *(Loftness et al. 1995a, p.108)*. Indoor environmental factors include air quality, temperature, lighting, and their design and operation.

Workplace air quality is usually the most important indoor environmental factor. If occupants lack an adequate supply

Natural light and ventilation, as in the Center for Building Performance and Diagnostics at Carnegie Mellon University in Pittsburgh, have been shown to increase worker performance and enhance the quality of the workspace.

Courtesy of GSA Office of Governmentwide Policy, Office of Real Property.

of fresh air (i.e., oxygen), they become lethargic and less productive. In "sick" buildings, many factors combine to produce heightened occupant sensitivity to indoor air pollutants, resulting in lost productivity, increased absenteeism, and added health care costs.

While minimum codes and standards for ventilation must be met in building system designs, remember that they are just that – minimum standards. The real occupant needs may be far higher. Use caution when implementing energy-saving measures, especially as applied in retrofits. Often, they can reduce outside air ventilation and adversely affect indoor air quality. Consideration should be given to use of operable windows, higher-density ventilation distribution systems, and individual occupant control of air distribution.

The choice of interior finishes can also greatly affect air quality. Off-gassing of new carpet, fabrics, paint, and plywood, which occurs as they cure, can seriously affect occupants, particularly in systems designed for the minimum required ventilation. Materials and their installation techniques can be specified in a way that minimizes the release of post-installation pollutants into the workspace, thereby reducing distracting and possibly harmful effects to the occupants.

Natural lighting from perimeter operable windows or interior atria, light wells, or courtyards, contributes greatly to indoor environmental quality. Lockheed estimates that employee absenteeism dropped by 15% after a move to a new building designed to maximize daylighting *(Sullivan 1998)*. Light can be controlled by various means, including

light shelves, built-in sun-screens, and building control systems. The effect of natural lighting can also be obtained by using special lamps in the light fixtures.

Sustainable Design

The Federal Government is committed to the use of products or services that reduce or lessen negative effects on human health and the environment. This commitment extends beyond consideration of raw materials, production, manufacturing, packaging, distribution, reuse, operation, maintenance, or disposal of products and services. It also applies to how we work, and where.

Sustainable design, also known as "green" design, can be applied in many ways:

> HOW WE WORK: including "paperless" offices, using remanufactured toner cartridges, recycled content copier paper, and energy-efficient appliances, computers, printers, and other office equipment.

> WHERE WE WORK: including a conventional office setting or teleworking—at home, at a telecommuting center, or with a computer and a cell phone from anywhere.

> HOW WE GET TO WORK: including the use of mass transportation, alternative-fuel vehicles, transit subsidies, bicycle parking, and walking from nearby housing.

> HOW WE BUILD, LEASE, FURNISH, AND DISPOSE OF OUR BUILDINGS: adapting and re-using historic structures, using items with recycled content, such as paper, paint, carpet, insulation, tile, paving, cement, concrete, and steel, installing energy management control systems and energy-efficient lighting and equipment, and minimizing construction waste.

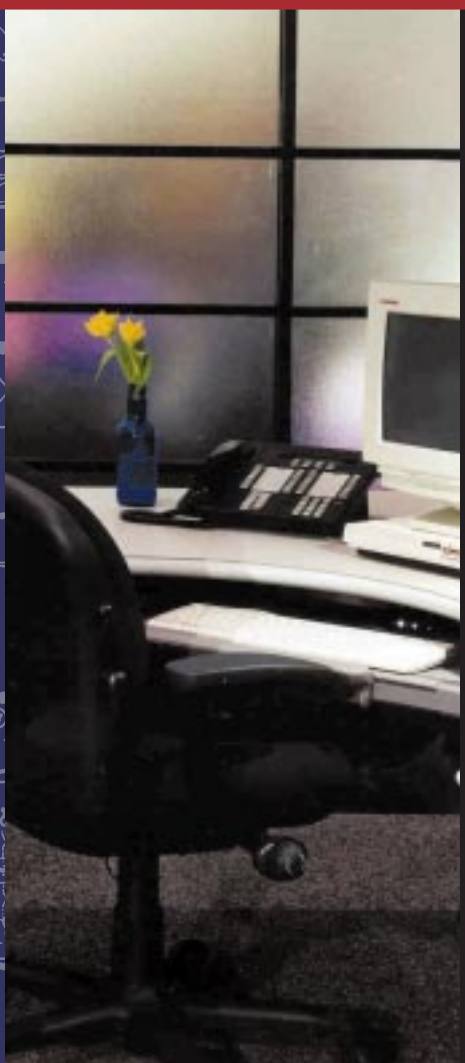
> HOW WE OPERATE AND MAINTAIN OUR BUILDINGS: including use of reformulated paints, cleaners, and other chemical products, low-maintenance landscaping, regular maintenance and "tune-up" of equipment, minimizing operation hours, and using smaller building zones that facilitate shutting down unneeded equipment and lighting in unoccupied areas.

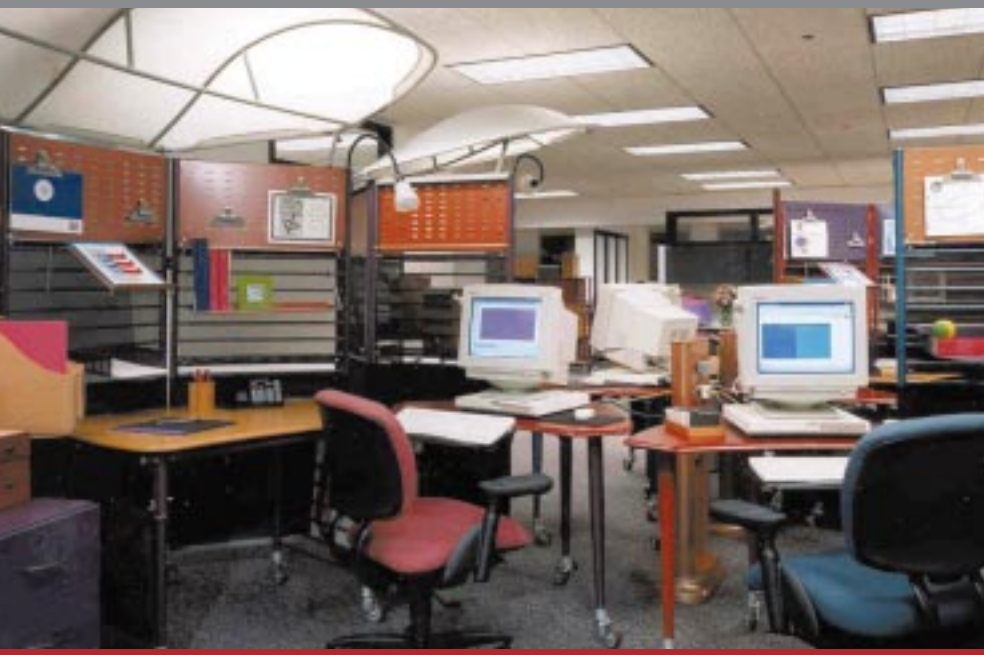
THE INTEGRATED workplace

4

case study

National Partnership for Reinventing Government





National Partnership for Reinventing Government

Washington, DC

Occupants

National Partnership for Reinventing Government (NPR)

Design

Settles Associates; Project Management: GSA Public Buildings Service, National Capital Region

Contact

Lois Bennett, GSA Facility Design, lois.bennett@gsa.gov
Cherie Stallman, NPR, cherie.stallman@npr.gov

Project Background

The National Partnership for Reinventing Government (NPR) needed to develop office space that would best support their new organizational work criteria of teaming, workspace flexibility, and telecommuting. Since the NPR staff is transient and staff size can vary greatly, the traditional office design model was not appropriate. The General Services Administration led a collaborative process between the users, the designers, the project manager, and the building owner, to create a new space use model that provided increased flexibility and staff capacity without requiring additional leased space.

Interactivity and interconnectivity are the main goals of the new offices. The space is designed to facilitate the collaboration and communication of the highly mobile, team-based workforce using it. The space, furniture, and technology are designed to enhance interaction and productivity.

With technology, the NPR office can be anywhere a staff member can access a computer or phone—at home, at a telework center, or "on the road" at an airport or hotel.

One of the most creative innovations at the NPR offices was the project delivery system. GSA provided a complete, integrated, turnkey package that included design, construction, space leasing, furniture leasing, computer leasing, telecommunications, and network services, all included in NPR's yearly rent. This frees NPR from having to provide facilities administration and allows them to concentrate on their core mission. It also provided them with fixed, predictable expenses for three years.

Integrated Workplace Concepts Employed

People

> User input into space design was obtained by holding "brown-bag" lunch discussions.

> Because much of the individual work is done off-site, NPR was able to create an office with 40 workstations supporting 56 people, and with the flexibility to accommodate up to 80 people.

> The space is an open office environment with large teaming areas, surrounded by workstations. Each team is responsible for management of its own space.

> The "virtual office" is an important component in the NPR workspace. The goal is to allow employees to function from many locations so people do not have to always be "in the office."

Space

> The space is designed to facilitate the collaboration and communication of the highly mobile, team-based workforce using it. Workspace was built around the new work patterns and organizational practices of NPR.

> The new space was used as an agent for change. The office is designed to encourage team thinking and group participation, as well as individual work both in and away from the core office.

> Generic workstations were provided to accommodate shared use.

> "Display thinking" was used to externalize thought processes and get group feedback and is supported by tackable and write-on wall treatments.

> All teaming spaces are multifunctional and have furnishings that can be easily reconfigured to accommodate different work practices.

> Three major furniture manufacturers, Haworth, Herman Miller, and Steelcase, furnished a portion of the office, demonstrating different approaches to accommodating the needs of the new office environment.

> Multipurpose, modular furniture and partitions and break-down conference tables were used in teaming areas, which can then be converted to personal workstations.

Technology

> Personal phone numbers that follow the individual regardless of work location were used.

> The office was provided with voice mail, caller ID, and three-way conferencing capabilities.

> The computer network provides digital remote-access from anywhere.

> A wireless local area network (LAN) was installed on a pilot basis.

Project Results

(best practices, lessons learned, benefits gained)

> A coordinated, turnkey effort delivered to the customer requires considerable flexibility in procurement and construction methods.

> Upper management support of the project was crucial to its success.

> Use of shared space is a big cultural adjustment that requires suppressing the natural urge for “nesting.”

> The space users must work out and formalize office use protocols.

> Open team spaces can be distracting to others working nearby. Acoustic separation of group meeting areas is essential.

> The new open environment does not support workers who must do quiet, individual work, such as speechwriting. People feel forced to go elsewhere to perform work requiring individual concentration.

> Alternative officing works best with self-empowered, motivated people.

> The costs for a “new work environment” are higher than for a traditional office.

Photos by Hoachlander-Davis Photography courtesy of GSA Public Buildings Service Marketing Division.
Floor plan by Settles Associates courtesy of GSA Public Buildings Service

Access and views to quality outdoor space are basic human needs that provide stress relief and assist in attracting and retaining employees.

Courtesy of Owens Corning.

Other Building Features

Many other design features affect the quality of your workplace. Among them are:

Arrival

Your employees will be arriving at work many ways: by car, train, bus, bicycle, maybe even on foot. Management's knowing how they get there and accommodating their modes of transportation (e.g., providing parking or bike storage) can greatly influence how they feel when they get ready to work. Remember that even teleworkers need to come to the main office for an occasional meeting.

Outdoor Environment

The siting of your office and its relation to the outdoor environment and landscaping can contribute greatly to the quality of the workplace. You may want to consider amenities such as outdoor eating and meeting areas, or simply places in which to visit and relax.

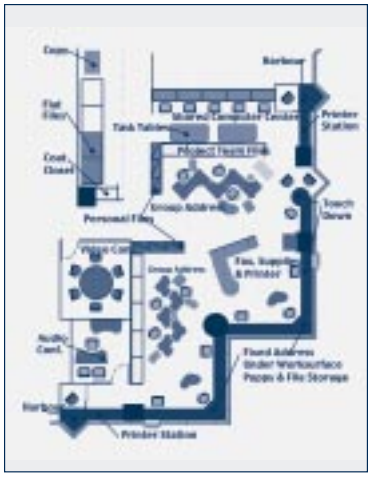
Accessibility and Cultural and and Environmental Resources

Design, construction, and alterations of Federal buildings must be consistent with laws that protect cultural and environmental assets and require a fully accessible workplace. Other resources, such as GSA's Art-in-Architecture program, are also available to enhance the workplace.

Security

Recent events have made us all more conscious of the need for a more secure workplace. The two types of security that need to be integrated into your office are physical and technical security.

Physical security generally includes perimeter, entrance, and interior security. Often, implementation includes the use of hardened barriers, closed-circuit TV, security guards, magnetometers, X-ray machines, and special identification systems. Achieving a



Appropriate space planning concepts that support specific work patterns will assist in achieving organizational objectives.

Image by HOK courtesy of GSA Public Buildings Service.

The space must conform to human needs and work requirements, and must be accommodated by the building infrastructure.

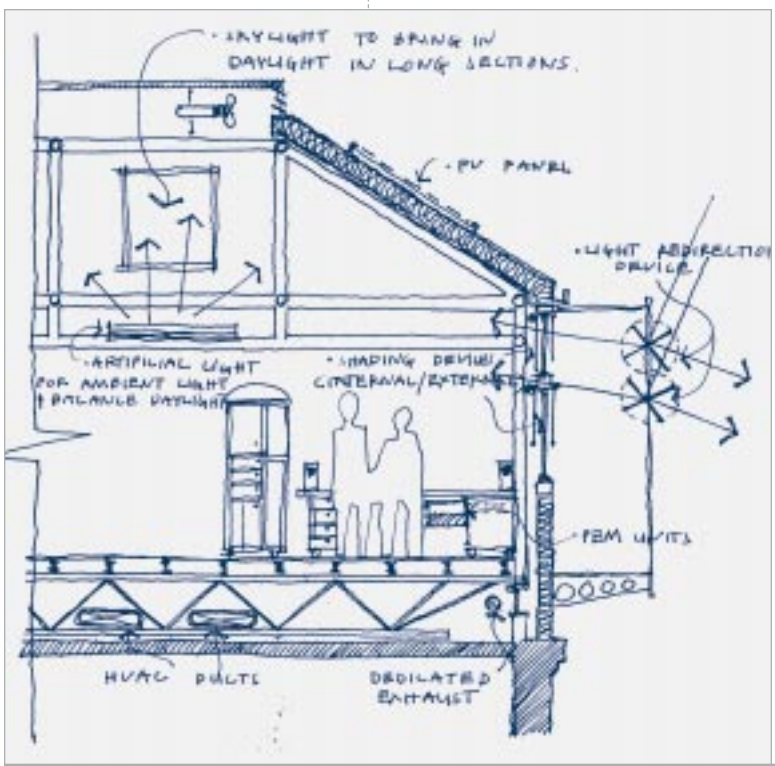
secure workplace within the guidelines of the Department of Justice's "Recommended Minimum Security Standards" can be a balancing act between openness and protection, privacy and public access, savings and costs.

Technical security planning includes document encryption, computer access and use monitoring, electronic document protection, shielded conference rooms, and use of scanning and optical surveillance technology to control access to sensitive areas. Technical security considerations address items as small as a computer file or as large as an entire campus.

Interior Space Design

A well-defined space requirements program that accurately reflects the people and processes of your organization will produce the best interior space layout.

Your interior designer/space planner will help develop the most appropriate space planning concept for your particular organization, or for different groups within your organization, depending upon such variables as the organization's size, age, structure, and the type of activities performed. As organizations evolve and their spatial needs change, different planning concepts may serve them better. Not only is it important to consider the most appropriate planning concepts, but also "which physical, environmental, and technological settings will allow the smoothest migration from one space planning approach to the next" *(Loftness et al., 1995a, p. 2)*.



Courtesy of Center for Building Performance and Diagnostics, Carnegie Mellon University.

It is important to consider space requirements from a functional standpoint, rather than as a perk related to rank or status. How a person must work, and the space needed to accomplish the work, should be the primary considerations. In such a paradigm, an administrative assistant entrusted with maintaining large files, or a person dealing with large-format documents or complex processes, may well need more workspace than their supervisors. In some instances, private offices may be justified; in others, the need for more open communication and space or cost limitations may call for open workstations.

The Carnegie Mellon University Center for Building Performance and Diagnostics has identified the most common space planning concepts in use today *(Loftness et al. 1995a, p. 2)*. They are classified as:

Assigned, or Territorial, Workspaces:

- The Vast Open Plan
- Cluster Open Plan
- Closed Offices, Shared Closed Offices, and Combi-Offices
- Combination Open and Closed Offices
- Caves and Commons
- The Mobile Workstation
- The Portable Office

Unassigned (Non-territorial, Just-in-time) Workspaces:

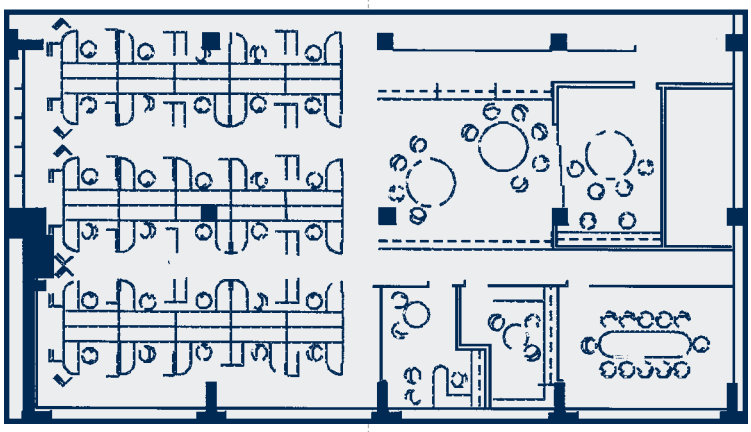
- Free Address
- Hoteling
- Red Carpet Club Offices

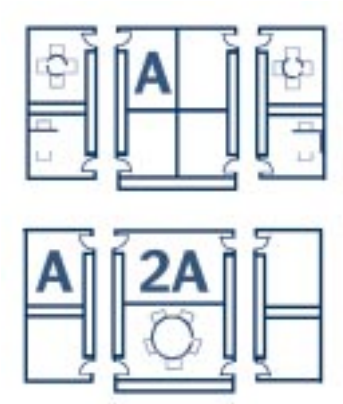
The GSA Public Buildings Service has summarized the major office space planning concepts. For each one, consider how it might support your business goals, what impact it will have on your business operations, and how it will affect your employees' daily work routines:

- Privacy Spaces: Where employees can work and concentrate without constant interruptions but still have access to voice and data communications.

The Steelcase Personal Harbour® workspace provides ready-made privacy areas for a busy office.

Photo by Hochlander-Davis Photography courtesy of GSA Public Buildings Service Marketing Division.





Universal design options reduce the number of space standards and reduce the cost and downtime for reconfiguration by establishing a common module that is used to develop most workspace.

Images by HOK courtesy of GSA Public Buildings Service.

> Team Space: Dedicated spaces, available either on an ad hoc daily basis or for longer periods, that allow group tasks to be done.

> Universal Planning: A common size or module that fits most uses. This design tool can accommodate fixed and open design concepts.

> Community Space: Areas for informal, social gathering and conversation (e.g., seating areas, kitchen, and coffee bar).

> Conference Room and Multimedia Spaces: Enclosed space with separate capability for a television/video monitor, slide projector, etc.

> Hoteling and Moteling: Non-assigned workstations that can be individually reserved for use.

> Aesthetics: Use of color, materials, and layout to create a pleasing, stimulating, appropriate, and professional environment.

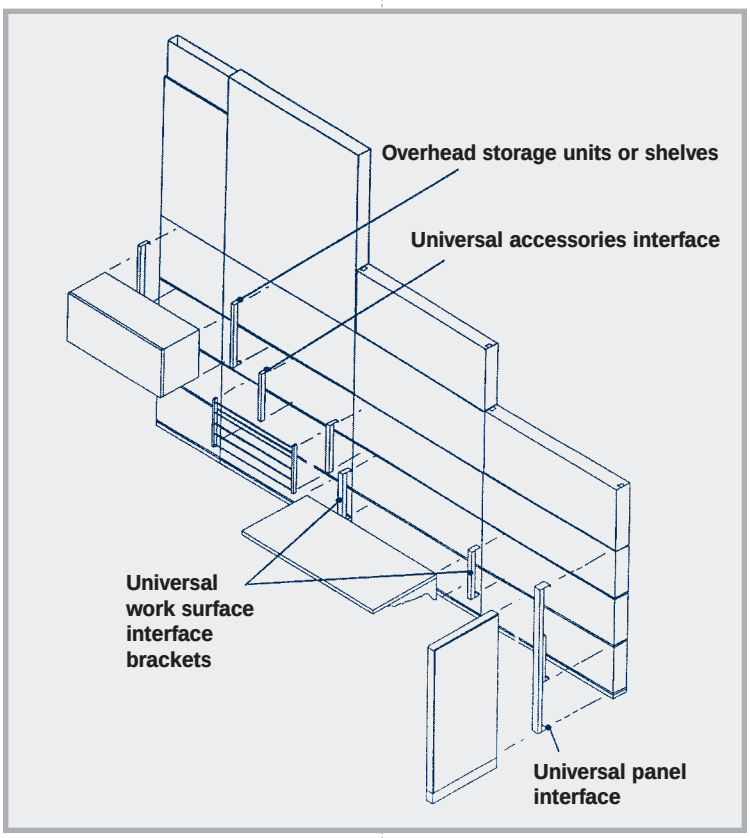
> Views and Vistas: Providing the maximum views to the outside by leaving the window walls unblocked .

> Ergonomics: The entire environment, not just furniture, designed and provided to benefit the health and comfort of the employees.

Areas to socialize and meet informally improve communication and office morale.

Courtesy of Steelcase North America.

- Signage/Wayfinding: Aids provided to help locate and identify offices and create a sense of place.
- System Modularity: A regular, interchangeable system allows for maximum flexibility and reconfiguration of the space to meet changing functional needs and number of staff.
- System Redundancy, Durability, and Maintainability: HVAC, lighting, power, security, and telecommunications systems with back-up capabilities to ensure minimal loss of service.
- Artificial Lighting: Appropriate levels and types (direct, indirect, and task) of lighting allowing employees to control levels of light as necessary.
- Daylighting: Natural daylight supplied to the greatest number of people by leaving the window walls unblocked or using translucent partitions or windows where closed spaces are necessary.
- Air Quality: Allowing workers to adjust the space for thermal control to meet personal and team comfort levels for fresh air, thermal control, humidity, and odor control.
- Interior Landscaping: Natural plants and vegetation, helping to produce healthy air and create an attractive working environment.
- Acoustics/Noise Reduction: Methods to provide a suitably quiet general work environment or quiet "havens" within the general office space, Can also involve mechanical reduction of ambient noise using sound masking (white or pink noise).



Haworth's Causeway™ panel system provides flexible space dividers that can vary in height and materials, accommodate larger amounts of cabling, and can accept all types of attached and freestanding furniture – even those made by different manufacturers.

Used with permission of Haworth Inc.

Furniture must support the type of work done, not require the work to be adapted to the furniture.

Courtesy of Herman Miller Inc.

Flexibility in reconfiguration is a must for dynamic organizations that expect frequent change.

Courtesy of Haworth Inc.

> Communications: Conditions permitting easy communications among workers, while allowing simultaneous access to data.

> Safety/Security: Adherence to health and firesafety codes and physical and technical security precautions so employees feel safe and comfortable.

Furniture

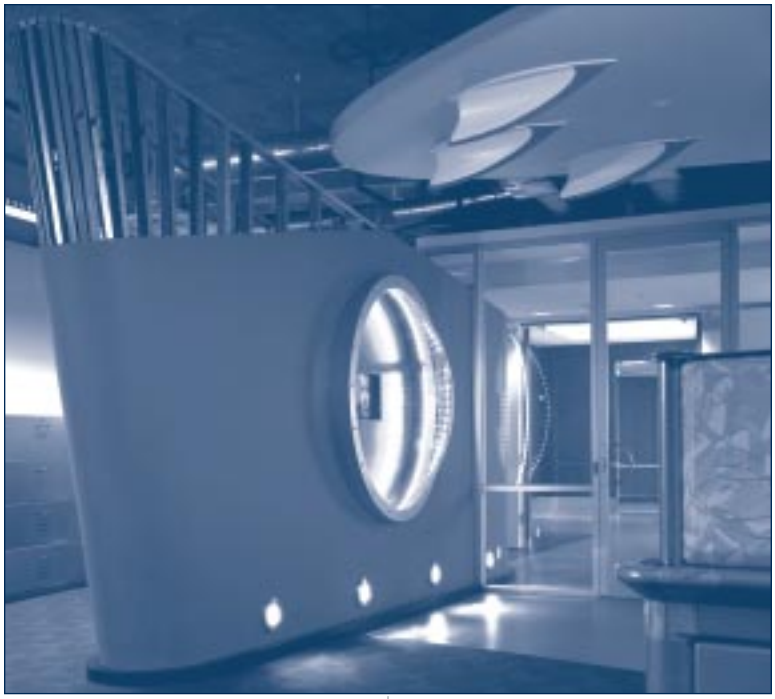
Furniture is where the workspace gets personal. In the individual workspace, culture, design, and technology are interdependent. As with the rest of the Integrated Workplace, furniture must be suitable to the individual's and organization's work practices. It must fit the image of the organization but still be able to adapt to the idiosyncratic work habits of each worker.

In many ways, furniture manufacturers are leading the research into how the office environment affects its occupants. They recognize that different kinds of furniture are needed to accommodate new ways of working and new technology. They don't just sell you chairs and desks; they also offer consulting on business practices and productivity. By determining early on that you must buy new furniture, you can take advantage of manufacturers' expertise in business process re-engineering, change management, and productivity.

The major factors to consider when selecting furniture are:

> Task support: Does it support the types of work tasks and practices of the users and the organization?

> Flexibility: How easily does it accommodate individual, shared use, and physical reconfiguration changes?



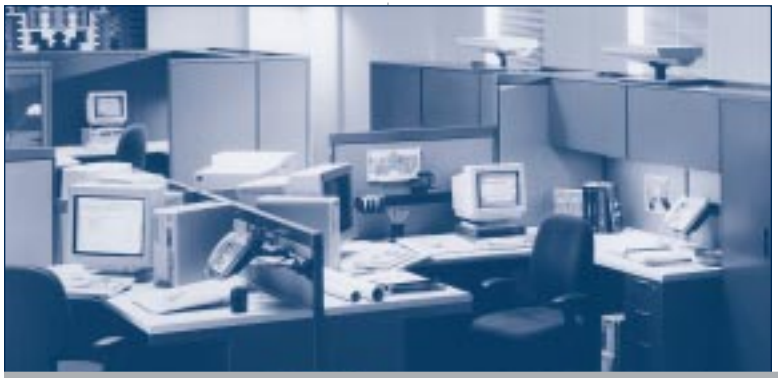
Aesthetics are an important consideration to instill a sense of pride and present the right image.

Courtesy of Haworth Inc.

Varied options in furnishings can create spaces that work but look less institutional.

Courtesy of Haworth Inc.

- Ergonomics: Does it support healthful working conditions?
- Space requirements: Does it fit the location and uses needed?
- Value: Does its life-cycle cost make sense? If you plan to use it only for a few years, do you need to spend money on furniture built to last 20 years?
- Technological accommodation: Will it support the computer, phone, and other office tools needed now and be flexible enough for future changes?
- Image/Aesthetics: Will it fit your corporate image and contribute to a pleasing, comfortable work atmosphere?



Your new space must include furniture that suits the work tasks, can adapt to user needs, and accommodates appropriate technology.

Courtesy of Herman Miller Inc.

Courtesy of Haworth Inc.

Courtesy of
Herman Miller Inc.

The New Office, Francis Duffy describes the trend toward more flexible, mobile, and varied work settings as they apply to recent innovations in furniture design and layout *(Duffy, 1997, pp.83-85)*. They include:

> Use of shared, modular privacy units

> The Combi-office, small individual offices adjacent to shared team space

> Mobile, re-configurable furniture that can be quickly rearranged by the users for different tasks

> New furniture for small, informal meetings

> Varied types and styles of furnishings that support a more informal design approach

Courtesy of Haworth Inc.

> Accessibility: Is it easy and inexpensive to adapt the workstation to accommodate persons with different needs?

The organizational culture influences how personal workspaces are developed and the degree of acceptance by the employees. In his book

Courtesy of Steelcase North America.

Special computer tools assist in a full range of communication needs for the visually impaired.

Ergonomics

The Occupational Safety and Health Administration (OSHA) defines ergonomics as the science of fitting the job to the worker. When the physical requirements of the job and the physical capacity of the worker clash, physical problems—most notably musculoskeletal disorders (MSDs)– can result.

Workers who must repeat the same motion throughout their workday, who must do their work in an awkward position, who must use a great deal of force to perform their jobs, who must repeatedly lift heavy objects, or who face a combination of these risk factors are most likely to develop MSDs.

Often MSDs can be prevented by simple and inexpensive workplace changes like adjusting the height of working surfaces, providing better body support, varying tasks for workers, reducing the size of items workers must lift, and encouraging short rest breaks.

A small investment in proper office ergonomics is easily justified. In 1998, almost 12,000 medical and compensation claims for carpal tunnel syndrome alone cost Federal employers over $110,000,000. Nationwide, in 1993, MSDs cost employers more than $20 billion for 2.73 million workers' compensation claims, with indirect costs as high as $100 billion.

Ergonomics must be considered in each area of the Integrated Workplace *(Commerce 1998, OSHA 1998, Karp 1998)*:

> PEOPLE: Be aware of work processes and activities that can lead to MSDs and other physical problems or that can further injure persons with disabilities. Remember, too, that ergonomic furniture and adaptive equipment can work only if they are positioned properly and employees are trained to use them.

> SPACE: Office environment and furnishings must support good posture, body mechanics, and work techniques. Workstations should provide for user adjustment of seating, computer

The computer workstation must be fully adjustable to provide correct positioning for each person.

Special equipment is available for all needs.

All photos courtesy of GSA Office of Governmentwide Policy, Center for Information Technology Accommodation.

Ergonomic computer keyboards help avoid physically debilitating injuries.

Courtesy of GSA Office of Governmentwide Policy, Center for Information Technology Accommodation.

Standing workstations provide another ergonomic workspace option.

Courtesy of GSA Office of Governmentwide Policy, Center for Information Technology Accommodation.

equipment placement, light levels, work surface heights, and even ventilation. Office layout can contribute to worker comfort and safety. People can rest their eyes by looking to a distance of 25 feet or more, through hallways, windows, or transparent workstation panels.

> TECHNOLOGY: Visual fatigue and repetitive strain injuries can be minimized or prevented through use of readily available computer hardware and software. These include speech synthesis and recognition, infrared technologies, alternative displays and keyboards, wrist rests, adjustable keyboards, and monitor supports.

Psychological Effects of Space

There is another less tangible and less explored aspect of space that must also be considered by those responsible for developing workspace—the psychological effects of space on the occupants. All the elements that make up the workspace elicit responses from the users that are important but often not considered in traditional office design. Light, color, enclosure, visual variety, physical relationships, acoustics, and other qualities of space affect people's behavior and performance in subtle ways that may not be as readily apparent to them as more perceptible effects such as feeling too warm or cold.

The links between building design and the productivity and well-being of building occupants is being explored by Judith Heerwagen, Ph.D., a staff scientist with Battelle/Pacific Northwest National Laboratory in Seattle, Washington. In a paper presented to the American Institute of Architects *(Heerwagen 1998)*, she summarizes the growing body of knowledge

linking human behavior to the built environment. She notes that Dr. Stephen Boyden has defined "well-being needs" that are relevant to building design *(Heerwagen 1998, p. 3)*. They include:

> Opportunity to engage in spontaneous encounters

> Freedom to move from solitary work to group interaction

> Opportunity to engage in a full range of behaviors, including creativity, self-expression, cooperation, and exploration

> Opportunity for regular exercise

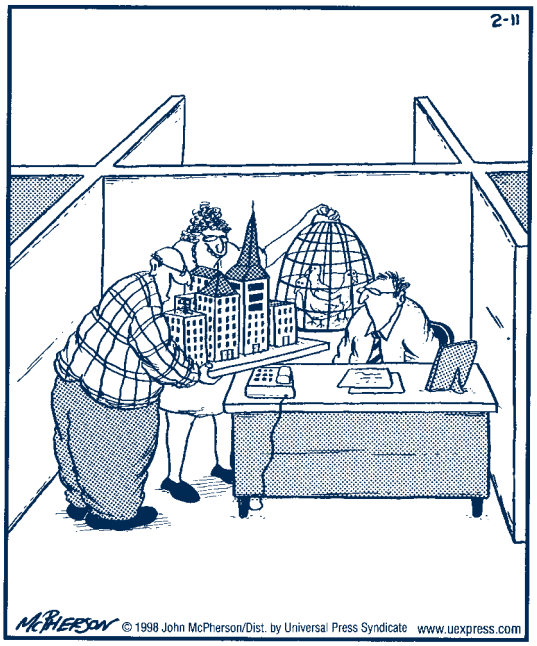
> Noise levels similar to those in nature

> Meaningful change and sensory variability

> An interesting visual environment

Based on her research, she states that "to fully understand the relationship between buildings and people, we need to integrate traditional building science emphasis on ambient conditions with an understanding of the evolutionary pressures that underlie environmental preferences and experiences. We also need to recognize that our ties to nature are deep and enduring; when we sever these ties, we create conditions that are contrary to basic human needs" *(Heerwagen, 1998, p.5)*. A compilation of her findings on the effects of building attributes and features on the well-being and performance of the building occupants follows *(Heerwagen, 1998, pp.6–11)*:

> Buildings that integrate features and attributes that conform to preferred human natural settings, such as daylight, views, green vegetation indoors or in



"As part of our commitment to employee morale, anyone who isn't near a window is being given this scale model of the downtown skyline and three pigeons."

views outside, and some degree of sensory variability in ambient conditions are more likely to support health and well-being.

> A balance between visual access and visual enclosure, horizontal visual perspectives, the presence of tree-like forms (especially an overhead canopy), and multiple retreats are important for human emotional functioning because they provide a sense of refuge and retreat, balanced with the ability to strategically survey the surrounding environment.

> Well-being, which has to do with the quality of work life, motivation, psychological state, and social support, is affected by such features as the presence of daylight and windows, opportunities for active and passive contact with nature, sensory change and variability, and opportunities for relaxed enjoyment of the environment. Also important are spatial features that support privacy and the development of social relationships.

> Personal control over ambient conditions (such as temperature, light levels, and fresh air) is likely to promote performance.

> Positive moods, an important factor in both performance and well-being, are likely associated with aesthetic features such as daylight, windows, sensory variability, and contact with nature.

> The ability to adapt environmental conditions to individual preferences reduces discomfort and most likely negative moods, increasing the ability to focus attention on work tasks.

> Building problems such as thermal discomfort, glare, noise, and loss of privacy are likely to generate negative moods that are especially detrimental to complex cognitive tasks.

The presence of natural elements not only affects people's physical and emotional health; growing evidence suggests a strong link between the environment and cognitive functioning *(Heerwagen 1998, p. 8)*. Emerging research shows that humans probably use elements of the physical environment to aid memory. One consideration for enhancing this use of externalized memory in the workplace is through the implementation of "cognitive ergonomics." This approach to design addresses how work-

spaces are arranged to best support the way a person thinks and works.

Duncan Sutherland, a professor at George Washington University and the person who coined the term "officing" in the late 1970s, asserts that the brain requires a "rich stew" of sensory input from the environment to be most productive. The mind uses space to help structure memory, and the "one-size-fits-all" approach to workspace doesn't make sense for cognitive processes *(Sutherland 1998)*. He points out that research into the relationship of the mind and perception of space is in its infancy, and we have much to learn.

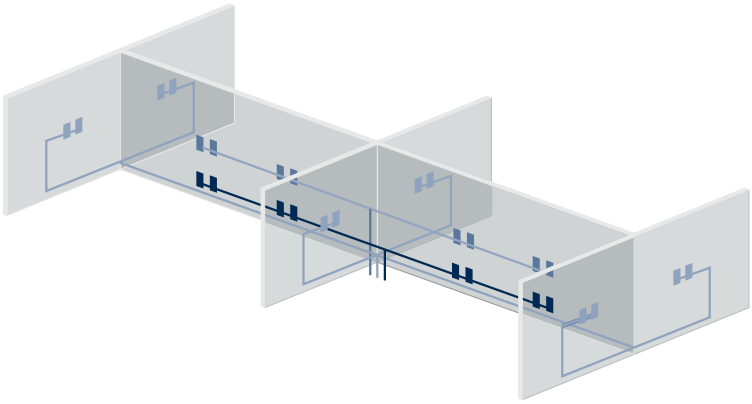
Even though supporting data is thin, current knowledge does indicate that the intangible effects of space on people should be dealt with in an Integrated Workplace approach. By looking at and identifying creative thought and work processes and what spatial elements may support them, your design team can develop more productive work environments that help individuals think, promote creativity, and support all the "people processes" that are important to your organization.

3. TECHNOLOGY: Accommodating Work Practices

What Sort of Technology Is Needed to Support the Changing Work Environment Now and in the Future?

Workplace technology provides the tools and methods needed to support the people and processes that define your office. It is the technology used directly by people in the accomplishment of their work tasks—such things as telephones, computer hardware and software, copiers, fax machines, and other equipment—that serves as an interface between people. This technology is constantly changing, sometimes as an evolution, sometimes as a revolution. These changes influence employee culture, the speed and accuracy of work being accomplished, and the methods of office communication.

New technology can save time and enable fewer people to do more work, but it can also slow performance during the



Herman Miller's Ethospace™ panel system provides flexibility for all workstation cabling needs where access flooring is not an option, and provides separation of data and power to avoid electrical interference.

Used with permission of Herman Miller Inc.

learning curve. It is important to always remember that technology is simply a tool, with no intrinsic value by itself. People, not technology, get the job done.

Choosing the correct technology for the task is essential to the Integrated Workplace. Technology that is not appropriately matched to the type of work can be counterproductive. For example, an answering system that identifies the caller and retrieves the caller's account information at the same time might be a boon in some contexts but not in others. Software that is incompatible with that of your customers or a phone system that requires dialing out to reach a nearby desk would be examples of poorly planned technology. The Integrated Workplace mandates that technology be the "right tool for the right job."

Just as the integrated office is dynamic, so must the technology that supports it be dynamic, too. Today's office must be supported by the most current appropriate tools: better telecommunication systems, computers, networks, desktop publishing, and business machines, such as faxes and copiers, that are used in the office environment. The designers must understand the physical constraints and infrastructure demands of all these tools. Design for technology is most importantly design for people—people with different tools, working at different speeds, within constantly shifting organizational structures—but also people with social, personal, and human needs.

It is also important to be aware of a continuing trend in technology: The convergence of communications and information technology. Although we still deal with them as separate project components, it will become increasingly difficult to do so in the future. Having professional consultants who understand both telephone and computer systems will become increasingly important.

Communication and Information Technology

Not that long ago, businesses communicated very differently. Within the office environment, written memos, personal calls, or person-to-person visits were the usual methods. There was a rigid protocol for communicating with management or other divisions of the company, which often made the entire process difficult, slow, and manipulative.

Today, new technology supports cultural changes such as:

- Sending E-mail directly to the office head, without a manager signing off
- Faxing documents from your car, using your cell phone
- Answering the phone by a machine that routes calls to the proper division
- Receiving training by satellite
- Checking someone's appointment calendar on the local area network (LAN)

Technology has changed many aspects of how offices communicate. These changes have had major influence on the working culture, design of the office, and the marketing audience. Since today's communication technology changes so quickly, it is vital to know if the technology is working for you and, if not, what the problem is.

As communications technology rapidly advances, we are seeing a growing dependence on computers as communication devices, gradually blurring the line between telephone and computer. Computers with faster processors, like those with Intel's MMX technology, speed up computational-intensive loops in multimedia and communications applications and are able to make and receive calls at the same time they are used for more traditional data processing applications. Some companies have done away with the telephone unit completely, replacing it with a computer equipped with a head set.

Problems such as software incompatibility and inadequate server capacity can stymie communication technology improvements. Consider the following problems:

Haworth's DataThing™ provides plug-and-play flexibility in furniture-based wiring systems.

Courtesy of Haworth Inc.

> When E-mail is sent out to co-workers, few can open the attachment and read the entire message because there is not enough memory on your company's LAN server.

> Because of its complexity, the electronic phone-answering system has led to five times the number of hang-up calls and a significant loss of business.

When technology is working, the means must be provided to make certain that it is effectively used. Consider the following enhancements:

> Enlarging your LAN servers to speed E-mail service and allow picture and sound files to be sent.

> Adding storage systems like "ZIP" drives to each computer to allow large files to be used without tying up the LAN.

> Providing sound cards and speakers to workstations to permit voice recordings of meetings to be sent over the Internet to employees.

Focus on whether the technology you are using properly is supporting the intended tasks, and keep informed of new technology that can serve you better. Only with the proper balance of function and technology can an Integrated Workplace be achieved.

Telephone Communications

Today's telephones can be used for much more than conversations between two people. Extensive changes in both the hardware and the software provide features such as:

> Caller identification

> Call waiting and forwarding

> Wireless handsets and speaker phones

> Multiparty calling and telephone conferencing

> Electronic call answering, routing, and voice mail

The new communication technology has had an impact on the office culture. In many offices, this technology has eliminated the need for administrative support personnel. User-friendly communication technologies allow employees to personalize their communication activities to suit their needs.

Computer-aided communications technology enables faster, more efficient, and sometimes cheaper methods of communicating. This technology permits such things as:

- Conversations on the Internet
- Sending E-mail both from desktop and palmtop computers
- Transmitting voice and data using satellites, cellular phones, and fiber-optic cabling
- "Light-to-sight" infrared computer communication

Wireless technology has changed the culture of the business place. With cellular phones, employees can communicate with clients or the home office at any time. Many businesses use satellites to transmit "field" transactions to the office, so that they can have accurate, "real time" information. Satellites also allow for many locations at the same time so that training can be provided economically, providing each student a "real time/live" instructor.

Data/Information Management

Because of voluminous new sources of information, such as web site databases, on-line libraries, and for-fee data banks, organizing and repackaging information in a usable form is becoming more important. Expert systems, which are discussed below, can sort through massive amounts of complicated information and are good examples of the possibilities of data/information management.

You should consult with experienced information management experts to determine what is needed and possible in your organization.

Software and Hardware Management

Compatible software, often combined as "office packages," can be sold, maintained, upgraded, and repaired by one source. An "office package" may include:

- E-mail
- Fax services
- Computer printing
- LAN and host application access

Wireless computer communications are now available, with improvements in speed and operation on the horizon.

Courtesy of GSA Office of Governmentwide Policy, Office of Real Property.

User friendly technology at the HUD Next Door office allows 24-hour access to information.

Photo by Walter Smalling courtesy of Gensler.

- Simultaneous voice/data communications
- High-speed data links to support large file transfers
- Data collaboration/workshare documents in real time
- Telephone call management applications like extended voice mail
- Desktop videoconferencing and desktop voice/video/data conferencing

Many offices lease computer and communication hardware instead of purchasing it. With a short-term lease, an office can have the latest technology without tying up limited resources.

Seat management services that provide all computer needs from one source offer Government agencies a new way of acquiring the full spectrum of desktop computing platforms and associated services. This may include general and special purpose computers, servers, and associated peripherals; local area and wide area networks; commercial off-the-shelf (COTS) software; help desk management; maintenance, design and installation, and training and technical support services.

Be certain that you have matched your office technology to the people and processes of your organization. Sometimes, just enough technology is better than too much. Some functions require little technology, while others must be supported with higher levels.

Expert Systems

One specialized use of computer software that has the potential to revolutionize the way we

do business is the so-called expert system. "Expert" or "knowledge-based" computer programs can draw upon specific areas of expertise to solve problems with little need for direct involvement from those with the expertise. Collaborative efforts between professionals and computer system developers have resulted in programs that diagnose diseases, configure computer systems, and prospect for minerals. The potential power of such systems, which can replicate expensive or rare human knowledge, has led to a worldwide effort to extend and apply this technology. They offer a way to leverage current expertise and simplify customer needs for information that involves analysis of complex data.

Generally, an expert system is a computer program that acts like a human expert. It can predict outcomes, diagnose problems or provide answers, and perform complex, repetitive tasks by manipulating large databases using structured rules to draw its conclusions.

Expert systems may provide either a single recommendation or several possible recommendations arranged in order of likelihood – just as a human expert would. The system can also provide the logical basis for each of the recommendations, adding credibility to the recommendation and educating the end user. They can lead a user through complicated procedures or complex documents such as Federal regulations and provide specific answers to their questions.

Thousands of expert systems have been designed for applications as diverse as credit risk assessments, computer network configuration, and automobile repair.

When Is an Expert System Appropriate?

Expert systems are useful, but they cannot solve every problem. Understanding when and why to use an expert system is important. Expert systems are designed to meet certain types of goals:

> Dissemination of problem-solving tools with minimal training of end users

- Standardization of conclusions for a given set of data
- Elimination of repetitive, routine jobs, allowing employees to function at a higher level by concentrating on more complex problems

Expert systems can target any combination of these goals. The problems that are best addressed by expert systems are those that are well understood—the kinds of routine questions human experts are most frequently asked.

Asbestos Advisor 2.0, an expert system developed by the Occupational Safety and Health Administration (OSHA), is an example of how an organization can make use of expert systems to simplify a complicated regulatory process and reduce staff requirements. This expert system is an interactive compliance assistance tool intended to introduce the scope and logic of the regulation to users and provide summary guidance. Once installed on the user's PC, Asbestos Advisor 2.0 interviews the user, asking about buildings and work sites and the kinds of tasks workers perform there. The recommendations it provides depend on the level of information provided by the user and range from general guidance to detailed guidance for a specific project.

What's Next in Technology?

The technological revolution is really in its infancy. The rate of development is increasing, and, according to David Pearce Snyder, a noted futurist, we are just now poised to begin reaping the benefits of the computer revolution started less than 50 years ago *(Snyder 1997, p. 54)*. So, what's coming up? Here is what a few noted experts are saying:

David Pearce Snyder

- Voice communication with personal computers will be common—there will be less need to type in information.
- The use of expert systems will be more widespread.
- There will be expanding use of computer simulations.

Leonard Kruk

- Computer and telecommunication technologies: Transmission of voice, data, and images faster, less expensively.

> Internet, multimedia, and teleconferencing technologies: Development of a more robust communications backbone that will improve computer interconnectivity by providing vastly higher speed, volume, and quality communications capabilities to home-based as well as commercial users.

> Image technologies, visual display screens, and input technologies: Interactive three-dimensional video, very high bandwidth communication channels, virtual reality.

Donald Soulsby

> Better data management will be more and more important.

> The problem will not be creating data, but finding the correct data.

It is important to keep an eye toward the horizon of breaking technology that should be considered in any workplace development. The design team should have access to this type of information when preparing for your new space.

Video conferencing will become more widespread as more people work remotely and technology improves.

Courtesy of Steelcase North America.

THE INTEGRATED workplace

chapter 4

Guidelines for Developing the Integrated Workplace

GUIDELINES FOR DEVELOPING THE INTEGRATED WORKPLACE

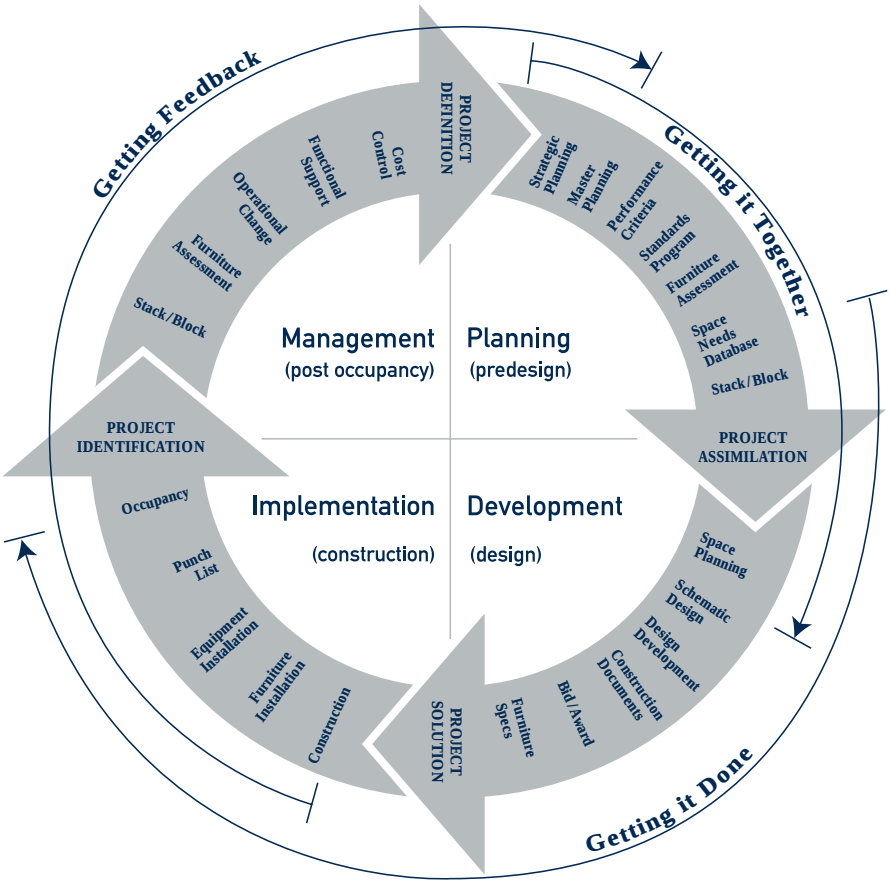
Introduction

To some extent, every office re-engineering effort considers the Integrated Workplace's three basic elements: people, space, and technology. Each of these elements will be discussed below, with guidelines to help you identify the project team and specialists who will be needed to successfully build a new workplace that matches your new organizational practices.

In this era of streamlining and downsizing, new work processes and technologies are often introduced into an organization without adequate consideration of supporting changes to the physical space. Usually, office workers find themselves moving into less space than they currently occupy – perhaps with new carpet and freshly painted walls. A properly constituted Integrated Workplace project team will get you beyond the "new carpet and paint" approach to create the office you need to carry out your mission.

Developing workspace is almost always part of a major renovation project, but often space changes occur through a series of smaller projects or minor changes over a long time. It is important that these interim, incremental changes made to your work environment have a long-range focus that moves your organization closer to its workspace goals. Developing a "master plan" as part of your strategic business planning process that sets workspace goals will help guide future changes. It will assist you in making space changes, including major building renovations, partial tenant renovations, and small changes in space configuration or equipment, that build upon past work rather than replacing it and move you closer to achieving your optimum workplace.

Below are issues to consider when developing an Integrated Workplace strategy that is effective for your organization. They are organized by the typical project development phases —planning, implementation (including design and construction), and post-occupancy management. For organizational purposes, topics within each phase are broken down



The three phases of Integrated Workplace implementation are supported by the traditional four-part design process model developed by Sindik Olson Architects in Santa Monica, California

Courtesy of The American Institute of Architects, 1735 New York Ave., NW, Washington, DC 20006

by the basic elements of the workplace: people, space, and technology. However, in an integrated process, there is always overlap among the topics and separating them cleanly is difficult. So, think of them as subparts of a whole.

Since this entire process is so individual to each work group within an organization, these guidelines are presented, not as a comprehensive checklist of solutions, but more as a series of ideas to get your creative juices flowing and get you to start thinking in the right direction. There are often no "right" answers, but there are perhaps, correct paths.

It is also assumed that the larger question of why this project is necessary has been asked and justified by the decision makers in your organization. Defining the motivation and goals of the project—the why of the project in business terms—is the first basic step and is beyond the scope of this initiative. In this report, we focus on the more tangible aspects of the workplace once the decision has been made and the need justified to develop new workspace.

1. Getting It Together: The Planning Phase

This is the nucleus of the Integrated Workplace project. Here, your organization should examine its mission, the reasons for undertaking this project, and the expected outcomes against which later measures of success will be taken.

In this phase, your office will develop strategic and master plans for the future. Think about how you do business today and where you would like to go – and most importantly, how space and technology changes will provide the tools to make those plans a reality.

Even if your organization cannot undertake a wholesale space reconfiguration all at one time, it is important to incorporate these Integrated Workplace principles in the strategic plan. This way, as work process, space, and technology changes occur over time, they can be made consistent with your long-term goals and funded accordingly.

The Project Team

First, consider who should be part of your workspace project development team. It should consist of both an in-house steering committee and the appropriate professional consultants.

The steering committee should mirror your organization in composition and be able to communicate your office's goals and ideas to both those planning and implementing the project and those who have a vested interest in the outcome, including management, financial officials, and the occupants. They should have goals in mind for worker interaction: ideas about the types of technology needed to support that interaction and about the types of space needed to support both workers and technology. Ideally, design, facility management, human resources, finance, marketing, information technology, and communications experts, and, most importantly, the space users themselves, will make up your steering committee.

Qualified design professionals, who understand and can achieve an integrated approach to the workplace, must be utilized as the other key part of the project development team to guide the complicated process of designing and constructing the new workspaces. Typically, architects or interior designers will lead a team of engineers (such as structural, mechanical, and electrical), specialty designers (such as lighting, acoustical, communications and fire safety) and other design and construction consultants.

In conjunction with this design and construction effort, reconfiguring your space will involve reviewing how your office works and how proposed changes will influence and be influenced by the new space. Consider the services of specialists in strategic business planning, work processes, change management, and technology to assist you, as well.

Your project development team should be assembled as early in the design process as possible. If they can participate with you in defining your organizational model and future goals, so much the better. Your design professionals need to understand your business—what you are trying to achieve, and how you are planning to achieve it. Ultimately, these should be presented to them in a unified, coherent manner, with the support of all levels within the organization.

For the design process to work effectively, a seamless dialogue must be established between the business process, information technology, design and construction professionals, and user team members. Assembling your project development team will likely require procuring services outside of the Government. With the help of sophisticated and creative contracting officers, procurement impediments can be avoided, and your focus can be on creating your new workplace.

Once your team has been assembled, work can begin to consider the needs of people, space, and technology in your new workplace. Below are many of the questions you

need to consider as you begin the design process. Don't expect to answer them all—just begin thinking about them.

People

Your Business Process Management Experts will help you focus on your core business, looking at critical processes such as information technology, logistics, customer-service management, finance, and administration.

Successful change requires expertise in human performance and connectivity with the strategy, technology, and process-related elements of your organization. It also requires a range of approaches and methodologies encompassing all aspects of a transformation—from changing workforce behavior to establishing new leadership teams. Your business process management expert will identify barriers and opportunities in your office and help manage its transformation *(Arthur Andersen 1998)*.

Before you even start to discuss what kind of space you need, you need to understand why change is needed. Try to define your organization and its work processes by asking questions like the following:

WHO ARE WE?

> Who are we today, who were we before, and who do we want or need to be in the future?

> Who works for us, and what will keep them here? How amenable are our people to changing work processes, moving to the use of alternative office arrangements, and employing new technologies? (For example, will they give up their office cubicle for a mobile one with a docking station at home and share a space in the office?)

> How motivated are the people in our organization? What defines us and the way we work (challenge, security, salary)?

> Do we have a union? If so, how will we involve them in defining the new workspace?

> Are people eager to work for us, or are we losing staff to others? Are we hiring or downsizing?

> How do people work together and communicate in our organization?

WHAT DO WE DO?

> What is our mission, our goals? Has our mission changed, or will it be changing in the future?

> Who are our customers? Are they internal, external, or both?

SHOULD WE CHANGE?

> Will there be cost benefits, increased productivity, and worker satisfaction?

> Will this change provide the amenities expected by our valued employees?

> Is changing our space needed to help initiate and support change, or will it just support the status quo?

> How will we continue to change and improve?

> Have we established methods and benchmarks to measure performance?

> Are special measures, such as retraining, needed to retain employees?

DO WE NEED NEW SPACE?

> Is new workspace necessary to support our business goals? If so, what do we expect to gain from a new workspace project?

> How do we inform the staff about the Integrated Workplace?

> When do we do this?

> Who should do it?

WHO IS ON THE TEAM?

> Who can best represent this organization's people and work process needs and goals on the Integrated Workplace team?

> Do we have in-house staff who can guide this effort?

> Do we need human resources, management processes, or other specialist consultants to assist us in this part of the effort?

Space

Your Real Property Design and Construction Experts will help you evaluate the physical space changes needed to support your new operation. Their services, depending on the scale of your project, can include: feasibility studies, master planning, site selection, and environmental impact engineering; interior, architectural and engineering design and management, construction management, and contracting; leasing, operations, and maintenance; and property management.

Consider what attributes of the physical work settings will best suit your organization in achieving your mission and goals. Ask yourselves:

WHAT TYPE OF SPACE WILL EXPRESS OUR OFFICE'S VISION?

> What do we need to accomplish our work and carry out our mission?

> Does our existing space accommodate new work processes and emerging technologies? What are the current barriers to accomplishing work?

> How do we work—individually, in teams (short-term, long-term, or multiple teams), or a mix of both?

WHAT KIND OF SPACE WOULD WE LIKE TO BE IN?

> Do we need to be enclosed or more open?

> Where do work groups need to be located? What adjacencies are important?

> In the future, will we need centralized space or satellite offices, or will people be working at home?

WHERE DOES OUR OPERATION NEED TO BE LOCATED AND WHY?

> In the city or a suburban or rural location?

> Near public transportation?

> If our workforce needs to be mobile, what implications will that have on a centrally located office?

WHAT ARE OUR MAJOR GOALS FOR THIS PROJECT?

> Can we attract and retain employees, consolidate space, improve productivity, and save money?

WHAT ARE OUR SECURITY NEEDS?

> What level of security is needed for our office: high, medium, or low?

> How do security measures affect our image and how we work?

> Do we have special technical security requirements?

HOW CAN WE PLAN FOR CHANGE?

> What must we do to provide maximum flexibility to accommodate future changes with the lowest impact on cost and productivity?

> Will evolving work practices be supported?

> Do innovative office systems (such as those with personal HVAC control) provide needed flexibility for reconfiguring spaces?

> How can the space needs of changing technologies best be supported?

WHO IS ON THE TEAM?

> Who can best represent our office's space needs and goals on the Integrated Workplace Team?

> Do we have in-house staff who can guide this effort?

> Do we need space planners, architects, and other specialist consultants to assist us in this part of the effort?

Technology

Your Technology Experts will help you identify appropriate technologies for your workplace with network consulting and analysis, LAN/WAN engineering and design, systems integration and installation, network administration and help desk services, systems procurement, and software engineering *(IOS 1998)*.

As you think about how you would like to work in the future and consider the environment which best suits that style of work, imagine how information technologies will be integrated into the new office. Ask yourself:

HOW WILL TECHNOLOGY ENHANCE OUR FUTURE OPERATIONS?

> What type of computers will employees need?

> How will we be connected? Who will need to communicate with whom?

> What types of technology will help us reduce space and personnel needs?

HOW WILL TECHNOLOGY CHANGE THE WAY WE WORK?

> Will employees be working in the office or out of the office?

> What type of office support will they need?

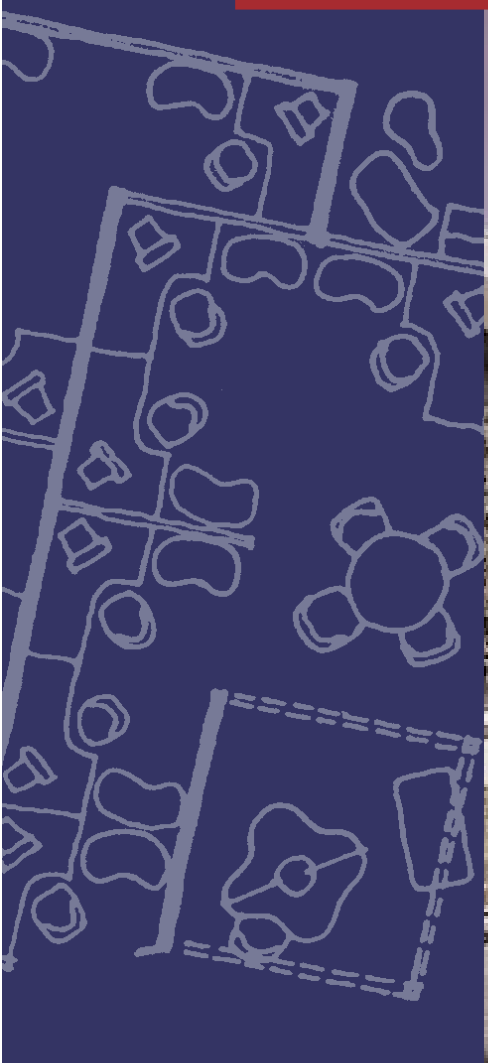
> How will we communicate? Do we need special interfaces with other technologies (e.g., E-mail, voice mail, local, wide area, and global networks)?

THE INTEGRATED workplace

5

case study

Owens Corning World Headquarters



Courtesy of Owens Corning.

Owens Corning World Headquarters

Toledo, Ohio

Courtesy of Owens Corning.

Occupants

Owens Corning Incorporated

Design

Cesar Pelli (base building),
Harley Ellington Design and Workplace Integrators (interiors), and
Steelcase Inc. (furniture)

Contact

James Eckert, Owens Corning;
Diane Lammers, Harley Ellington Design;
Scot Siegel, Steelcase North America
410 312-8360

Project Background

The new World Headquarters for Owens Corning, opened in April 1997, is a campus-like facility in Toledo, Ohio. This leased facility accommodates a staff of 1,200 in 400,000 square feet. The average individual workspace is 64 square feet.

For almost 30 years, Owens Corning's corporate offices occupied a 28-story landmark in downtown Toledo, Ohio. Named the Fiberglas Tower, this structure housed approximately 1,000 employees.

Top Image: Courtesy of Steelcase North America.

With the company's long-term lease expiring in 1996, a facilities evaluation team was formed to assess the existing Tower facility and its ability to support the new corporate direction. Comprehensive space use and feasibility analyses were performed in all areas of building operations, while extensive executive input was collected regarding future business plans and needs.

The conclusion was that the company needed a facility that enhanced long-term growth in organizational performance and business results rather than a facility whose primary attraction was short-term cost containment. The decision was made to build a new corporate headquarters that would reflect the new corporate image and structure.

Integrated Workplace Concepts Employed

People

> The new facility was designed to support the company's shift from a hierarchical, centralized organization to one that is flat, decentralized, team-oriented, and dedicated to a global, mobile, technology-driven philosophy.

> A new paper-free initiative was employed to change the way people worked.

> Steelcase and Harley Ellington Design's planning process began by helping Owens Corning's management envision critical aspects of the new workplace. Next came involvement of nearly 200 workers, which led to the following design parameters:

- Work settings were to be based on the activity performed—not on status or rank.
- A range of settings would be provided for the variety of work that takes place.
- Group work settings would be used to support a more participative culture.
- Many workers need periodic privacy.
- Technology should be accessible everywhere.
- Flexibility and user control to support frequent change should be built in.

> Professional development training was provided through a "Discovery Center" using self-learning through CD-ROMs, videotapes, management publications, and career counseling.

Courtesy of Owens Corning.

Space

> The flexible, horizontal campus arrangement reflects the company's enormous cultural shift. The headquarters building is a low-rise, three-story structure, stretching 1,000 ft. from end to end, with the Chair and CEO located in glass-walled offices in the middle of the second floor.

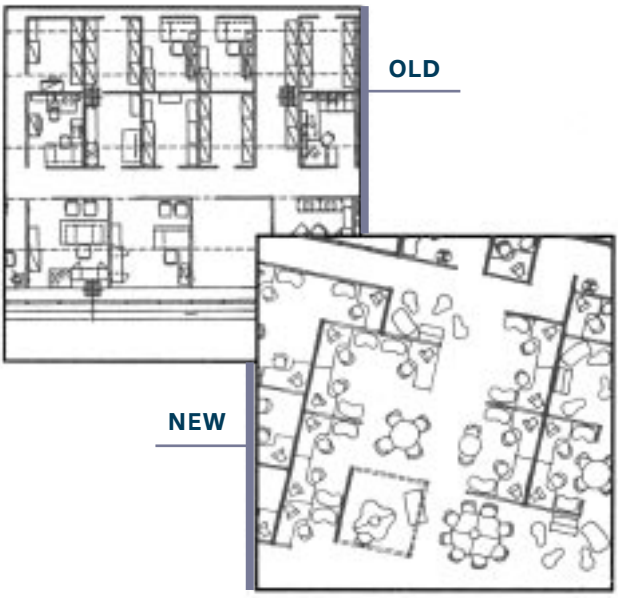
> Most individual workspaces are open and highly collaborative. Individual stations are relatively small, creating more room for group interaction. Private enclaves, available for use by any employee, supplement open areas.

> Corridors were intentionally widened to encourage interaction.

> All furniture components are freestanding and can be quickly reconfigured to keep pace with a rapid rate of churn. By combining freestanding furniture with specialized utility products, Steelcase created efficient floor-to-work-surface power and data connections.

> Steelcase's "Context" furniture system was used throughout, with vertical panels providing seated privacy, yet allowing easy visual and verbal access to co-workers. Curved work surfaces invite informal meetings for small groups. Storage towers hold materials and personal amenities in each workspace.

> Employees have access to a range of amenities and services that give the facility a college campus-like feel, including a fitness center, 275-seat auditorium, credit union, and convenience store with ready-to-serve dinners, dry cleaning services, and videos. Management encourages personnel to use the fitness center any time during the workday. Service amenities also allow employees to run errands on site, so they can remain more focused on their work.



Used with permission of Steelcase North America.

Courtesy of Steelcase North America.

Technology

> Eighty teaming rooms, located throughout the facility, are furnished with presentation equipment, computer log-in, and teleconferencing capabilities. Twelve of these rooms can be used as video-conferencing centers.

> The Owens Corning paper-free initiative was realized through three major elements:

- Messaging/daily communications: Every person has an individual fax number and all faxes arrive electronically to the desktop.
- Business information systems: A range of everyday business tasks, such as transaction information, customer orders, invoices, and inventories is automated under the company's "Advantage 2000" re-engineering initiative, which replaces a paper-oriented system with real-time, interactive information. Owens Corning's goal is to be 50 percent paper-free in external transactions.
- Filing/document retention: Documents are kept electronically for only one year, and no permanent paper file space is provided. Since the move, 50 percent of the copiers and printers and 60 percent of the fax machines have been eliminated.

> To produce an infrastructure that supports advanced use of technology, Owens Corning created one fully interconnected system featuring a global network to replace 200 separate systems.

> About 70% of the staff use laptop computers, and they have the ability to plug in anywhere in the facility.

Courtesy of Steelcase North America.

Courtesy of Owens Corning.

Project Results

(best practices, lessons learned, benefits gained)

> Strategic design is not a linear process. When a company is redefining its workplace as a critical business tool, discoveries accompany every stage of the process. The process is better defined by its interruptions and breakthroughs than by its timeline.

> User involvement takes time, but is worth it. In order to create a facility that supports new behaviors in a new work culture, workers must be involved in the process.

> Full interaction includes up-front comments on needs and concerns. Ongoing communication of project plans, complete reviews of proposed solutions, and modifications are essential to a successful outcome.

> Early and integrated involvement of all key players in the design process—architect, interior designer, furniture manufacturer and dealer, and corporate facilities management—led to better results in less time.

> Space was drastically reallocated during the design process. Despite significant reduction of individual workspace size (from 120 square feet to 65 square feet on average), total workplace size remained constant, primarily as the result of new teaming areas. Expect space to shift, not shrink.

Courtesy of Steelcase North America.

> More than 400 Owens Corning employees responded to a survey conducted 90 days after occupancy:

- 60% said their productivity has improved
- 80% are more customer focused
- 88% report a high level of teaming with departmental co-workers and 66% report a high level of teaming across departmental boundaries
- 77% are using less paper due to increased use of technology.

Courtesy of Owens Corning.

Courtesy of Owens Corning.

WHO IS ON THE TEAM?

> Who can best represent this office's Workplace Technology needs and goals on the Integrated Workplace Team?

> Do we have in-house staff who can guide this effort?

> Do we need information technology and other specialist consultants to assist us in this part of the effort?

2. GETTING IT DONE: The Implementation Phase

When you have identified the major goals of your Integrated Workplace and have considered some of the spaces and technologies needed to reshape your office, development and implementation leading to design and construction of the actual spaces can begin.

Getting Organized Internally

An in-house individual should be identified to guide your office's reorganization efforts. Procurement should begin for needed specialized professional services, such as space planning, design and construction, and information technology services. Later, as the schedule and budget are developed, other services will be identified. Services, such as move coordination, and alternative design and construction approaches can be considered. Ask yourself:

> How will our staff be kept informed of project progress and changes?

> At what points in the design process are critical employee issues resolved, and by whom?

> What training will be required for users of the new spaces and technologies?

> Who makes the final decision?

Getting Professional Help

A good design team is crucial to the success of the project. Professionals will guide you through the process of realizing your goals. They will answer questions like:

> How will your new office express your mission and culture?

> How will building systems, such as structure, HVAC, lighting, and security, serve your processes and staff requirements?

> How will furniture figure into your space layouts and business practices? What about issues like universal plan, the public/private spaces, and the Hallmarks of the Productive Workplace (see Chapter 3) that will assure successful results?

Due to the special nature of design and construction, design and construction professionals should oversee implementation of the project. They can direct the planning, design, and construction phases of the project or manage construction management contractors who will do that work. Working with your Government Contracting Officer, suitable design and construction procurement approaches can also be identified.

GSA or your facilities manager can identify a source for professional services to assist you.

Development, Design, and Construction

As the three basic elements of the Integrated Workplace—people, space, and technology — begin to intertwine, the project can begin. Your Strategic Plan should look at where you want to be in five to ten years. To help you participate successfully in the development, design, and construction processes, consider the following:

People

> What type of planning approach is to be used (e.g., top down, consultant/contractor, or organizationally horizontal team)?

> Are the necessary stakeholders or group representatives involved in the planning (e.g., employees, unions, employee relations, and the various occupational groups)?

> Do you need additional expertise regarding Integrated Workplace issues for planning purposes?

> What are the implementation needs? Do you need change management activities?

> How will the workflow and the quality of work life be maintained?

> Should you plan for a full-blown, gradual, or pilot-type implementation?

> What parts/locations of the organization will have new workplaces?

Patent Trademark Office

Washington, DC

Project Background

The PTO conducted a Flexiplace Pilot Program from March 1997 until March 1999, as a National Performance Review Reinvention Lab project. This pilot used alternative officing options of home telework and shared offices. PTO conducted this pilot to:

> Reduce commuting time.

> Take advantage of new technology.

> Provide incentives for retaining good people.

> Permit an increase in its workforce without increasing space.

Eighteen examining attorneys were involved; each with a workstation at home and a shared office at work. Previously, each attorney had a private office. Although each office is "owned" by two people, it is generally only used by one person at a time.

This project was done in partnership with the National Treasury Employee Union Chapter 245.

Integrated Workplace Concepts Employed

People

> Individuals can work at home three days a week, thereby saving commuting time.

> Since all attorneys are required to work independently, with no need for teamwork, working at home is possible.

Space

> The nine shared offices are in leased space. Since these were existing offices, no new construction was involved.

> In-house computer support was provided for setup of participants' home offices.

> Since each attorney went from a private office to a shared one, PTO was able to house more people in the same space.

Technology

> Home equipment included Pentium computers, but not fax machines. ISDN lines were installed in homes in devoted, secured locations.

> When not being used for work, home office space was usable for other purposes.

> Attorneys at home have access to all computer applications available at their office workstations. These include complex live databases necessary to perform their jobs.

Project Results

(best practices, lessons learned, benefits gained)

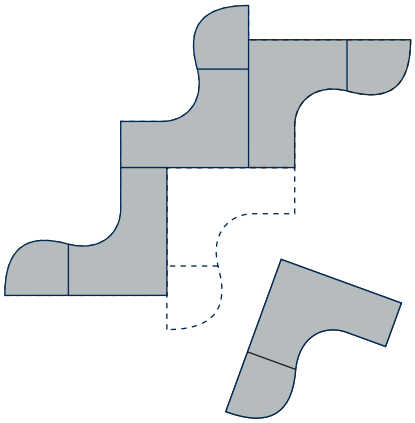
> Office sharing and the use of home offices provide the opportunity for increasing the number of employees without increasing space. The PTO pilot provided the opportunity to house twice as many attorneys in the same amount of space.

> Productivity improved due to saved commuting time.

> Employees and supervisors are pleased with project results and employee morale has improved.

> No negative impact on customer service was observed.

> PTO plans to continue the Flexiplace program and make it available to all attorneys.



Modular furniture can quickly adapt to changing needs.

Used with permission of Herman Miller Inc.

- What employees/customers will work in or be serviced in the new workplaces?
- What types of spaces are needed to accommodate the types of work processes each person encounters? Do you need dedicated privacy areas, team spaces, shared community space, conference space?
- How will you use the space? Will the workers stay in one place all day? If so, will they need dedicated individual workstations for all tasks?
- Do you wish to encourage working in teams? If people work on multiple teams, do they need dedicated project spaces to help foster teamwork?
- Will people be performing different tasks in different areas? Perhaps more shared space can be used, with specific areas for specific tasks?
- Consider how marketing this plan to your organization can make it succeed (e.g., using pilot programs, special presentations, videos, employee and management training, newsletters, etc.).
- What is the schedule for the Integrated Workplace project?

Space

- What tasks will help determine basic workspace sizes and configurations?
- How can you minimize the number of prototype workstations?
- Can individual workspace personalization be accommodated within the common elements and the budget?
- How will security be provided?
- How are you dealing with noise and privacy controls?
- What is the level of environmental control?
- Will pilots and mock-ups be required?

Technology

A comprehensive view is needed to ensure that the new technology interacts homogeneously with both the workplace culture and the office space design. Selecting the appropriate technology requires not only consideration of your employees' needs and skill levels, but also requires understanding of the

people and space needs of their work. Consider the following questions:

- How much flexibility do you need in occupied space? Do universal planning modules make sense?
- What technology will best support the way you will be working and what do you need in the space to support that? (For example, employees who use docking stations, rather than conventional, desktop personal computers, must have the necessary technology, access to office LAN systems, compatible programs, and home-based equipment and software.)
- Can you use pilot programs before making large-scale commitments?
- What does the office concept say about what technologies are needed, compatible with the organizational culture and supportive of the work to be done?
- What communication capabilities do you need—satellite, E-mail, or just telephonic communication technology?
- Is the infrastructure compatible with the proposed technology?
- Can you anticipate what extra capacity may be needed to support future office technology needs?
- Will pre-engineered, package-type systems or custom systems be used?
- What are your special technology needs?

3. GETTING FEEDBACK: Managing the Integrated Workplace

Maintaining an Integrated Workplace

Well, you've moved in, the dust has settled, and people are hard at work. Whew! Take a few days to relax and savor your accomplishments. But just when you think you're finished, its time to start measuring and reevaluating how your workspace accommodates your work practices and what adjustments are necessary. After all, a lot can happen within your organization in the time it takes to construct new workspace: People leave, new people arrive, you've reorganized again, your mission has been changed by a new administration, or whatever.

However, if you've planned ahead and provided appropriate flexibility in your workspace, all but the most radical of space adjustments should be able to be undertaken without earth- (or budget-) shattering repercussions.

To maintain compatibility between your workspace and your work practices, you need to evaluate workspace performance and its effects. Some ways to do this include post-occupancy evaluations and performance measurement.

A User's Manual

You probably wouldn't accept delivery of a new car or major appliance without getting a copy of the owner's manual. You should consider no less for your new office space. To help people make the transition to working in their new space, and to establish policies for working in them, an office user's manual with office protocols should be provided.

A users manual gives each person information on the use of his or her space and equipment, such as computer hardware and software, furniture (how to adjust and use the chair and use other equipment that affects ergonomics), phones, voice mail, the LAN, and other "things" that require explanation.

Protocols are standards of workspace use and behavior that will assist everyone in "getting along" with each other and in maximizing each person's performance. Protocols should address both work practices and space usage, since they are both related. They may include such things as phone "etiquette," acceptable noise levels, impromptu gatherings, use of team rooms, conference rooms, break areas, core attendance times, regularly scheduled staff meetings, quiet time, and ways to make suggestions.

It is critical that protocols be developed with the participation and general consensus of the entire organization's staff—otherwise, they will not have any relevancy and will be ignored.

"It's part of our new Campaign for Increased Productivity."

Getting the Facts: Workspace Performance Measures

These days, there is a lot of emphasis on performance measures and "hard data." It should be remembered that with people and work process issues, much is qualitative and not subject to simple numerical analysis. Where sensible numbers are available, use them; where they are not available, use good judgment; and remember the goals of the project should not be constrained by whether or not you can measure them.

Listed below are a few ideas on performance measures to consider. Unfortunately for you, there is no panacea, and only your organization can determine what is successful.

In their book *Peopleware: Productive Projects and Teams*, Tom DeMarco and Timothy Lister talk about the office environment and its effect on people working in it. They describe the problems of measuring the productivity of knowledge workers, but come to the conclusion that, where necessary, any measurement is better than none. They quote Tom Gilb, author of *Software Metrics*, with what they call "Gilb's Law":

> *Anything you need to quantify can be measured in some way that is superior to not measuring it at all.*
>
> *(DeMarco & Lister 1987, p.59)*

This doesn't promise that the measurement will be cheap or perfectly accurate, but it is better than nothing. This also assumes there will be no negative effects from doing the measuring.

Some measurements of workplace effectiveness to be considered include:

PRODUCTIVITY MEASURES:

- Turnover (measure retention of employees, cost of retraining)
- Absenteeism (sick leave, annual leave)
- Self-assessment
- Time-tracking devices such as log books, overtime, project hours
- Customer demand for products or services
- Observed downtime (for modifications, complaints, interruptions) (ABSIC 1998, Chapter 6, Section 2.1.2)
- Anecdotal evidence on workplace suitability: People's perceptions of workplace suitability are still a viable measurement, especially when from a "grass-roots" perspective.
- Churn costs: Employee downtime, space move costs, time to execute a move and get a person back up-and-running (phone, computer, etc.)
- Operating and maintenance costs
- Cost per person
- Cost per square foot (square meter)
- Cost per square foot (square meter) per person
- Customer (user) satisfaction surveys

Post-Occupancy Orientation, Monitoring, and Evaluation

When you move into your new workspace at the end of the design and construction process, you should provide an orientation program for all staff on your organization's new way of doing business. Employees must become familiar and comfortable with new work processes, new technology, and with their new workspaces. In some cases training will be required. It will take some time to become accustomed to your new surroundings and to take full advantage of all of its features.

How will you know if your new workspace is working for the individuals in your organization and the organization as a whole? You must, either quantitatively or intuitively, track and measure the performance characteristics of your workspace. Is it assisting or hindering productivity? Is it comfortable or not? Is it attracting or driving away your workforce? These are some questions to ask.

THE INTEGRATED workplace

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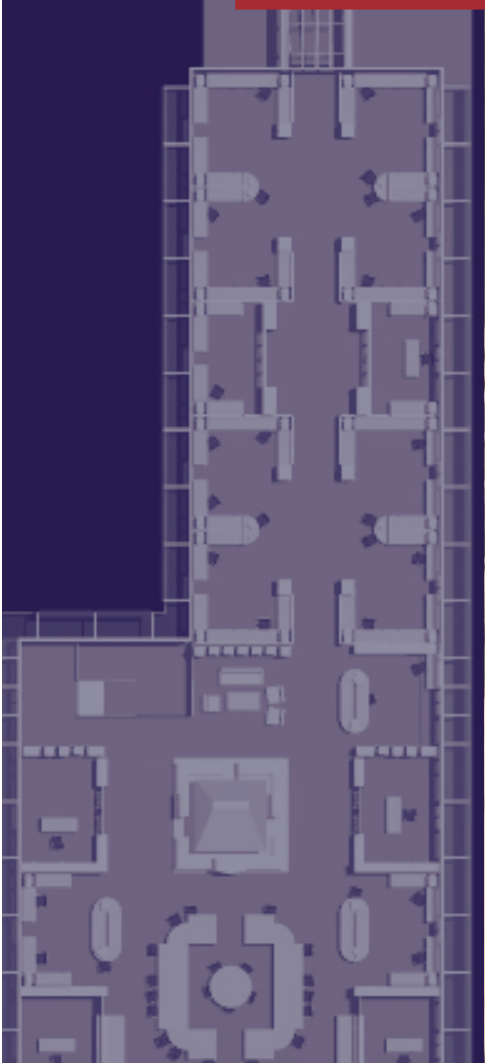
case study

The Robert L. Preger Intelligent Workplace



The Robert L. Preger Intelligent Workplace

Carnegie Mellon University, Pittsburgh, Pennsylvania

Occupants

Center for Building Performance and Diagnostics (CPBD)

Design

The Center for Building Performance and Diagnostics Team, with Pierre Zoelly, AIA; Bohlin Cywinski Jackson Architects; R. M. Gensert and Associates; Hornfeck Engineering Inc.; RAY Engineering; Project Management: Stephen R. Lee

Contact

Volker Hartkopf, Ph.D., Director, 412 268-2350

Project Background

The Intelligent Workplace (IW) is a 7,000-square-foot living laboratory developed by Carnegie Mellon University for testing workplace innovations in a real, day-to-day work environment. It is one of the major accomplishments of the Advanced Building Systems Integration Consortium (ABSIC), a group of industry, government, and university partners interested in advancing the state of the workplace.

The IW is housed in a newly constructed facility perched atop historic Margaret Morrison Carnegie Hall on the Carnegie Mellon campus. The major reasons for constructing the facility include:

> Testing organizational innovations for the advanced workplace;

> Testing innovations in information technology;

> Testing innovative enclosure, HVAC, and interior products for thermal, air, visual, acoustic, and spatial quality;

> Demonstration of product performance in the integrated setting;

> Training in material, component, and systems choices and their integration for performance; and

> Hands-on training in instrumentation and metrics for evaluating performance and occupancy comfort and in development of CAD packages for design and management.

The Intelligent Workplace will demonstrate advances and innovations in materials, components, and assemblies for thermal, visual, acoustic, air quality, and spatial performance in a "lived-in" office, research, and educational environment. The effectiveness of these elements in the built environment depends on how they are integrated with each other and how they address overriding concerns about resource management, health, and worker effectiveness.

The Intelligent Workplace is not envisioned as a one-time "show and tell" demonstration project, but rather as a dynamic environment for the teaching and evaluation of how integrated building components, systems, and assemblies affect building performance. The facility will also provide the platform to explore broad environmental and ecological issues such as recycling building products and long-term resource management. As a test bed for new ideas, and as a demonstration center for successful innovations, the Intelligent Workplace provides a unique living laboratory for developing better workplaces.
(Text adapted from the CBPD Web Site)

Integrated Workplace Concepts Employed

People

> Feedback from occupants is used in adapting and changing the space.

> Maximum access to the natural environment is provided for all occupants.

> Individual temperature and airflow adjustment is available at each workstation to accommodate personal comfort requirements.

> Workspace configuration can be personalized.

> Social work environments, including a service "pub," team spaces, and exterior gathering space, are accommodated.

Space

- Highly flexible, modular workspaces accommodate future changes.
- Individual control for HVAC and lighting are provided.
- The facility provides a healthy environment, free of building material pollutants and supplied with generous amounts of fresh air, natural light, and exterior views.

Technology

- Plug-and-play technology simplifies and reduces the cost of space changes.
- Maximum use of natural light, combined with split task and ambient lighting, resulted in a 30% reduction in lighting power consumption.
- Sustainable design concepts, including use of recycled materials, energy recycling and conservation, reusable infrastructure elements, and use of low-waste construction processes were incorporated in the project.
- Integrated infrastructure elements include open web trusses to accommodate passage of mechanical and electrical equipment, integrated floor structure and access floor plenum, use of structural elements as finished surfaces, and prefabrication of building elements.
- Split thermal and ventilation systems maximize performance of each system. Natural ventilation is used as well.
- Maximum voice and data connectivity is provided, with built-in component redundancy and ”just-in-time” connection capability.
- An innovative system allows user reconfiguration of data, power, and voice communications.

Project Results

(best practices, lessons learned, benefits gained)

- Acceptable light levels can be achieved during the day without any additional artificial light.
- Acoustic control in open plan offices is critical.
- Air supply at desk height with individual user control provides better air quality and comfort than ceiling or floor-based air distribution systems.
- Integration of proprietary building systems with each other requires careful coordination during design and construction, regardless of manufacturer claims of compatibility.
- Occupant control of building systems must be easy to understand and use.
- Careful product specification and construction oversight is necessary to assure that all materials used in the project comply with sustainable design and indoor air quality goals.
- There are definite links between the quality of the work environment and employee productivity. Quantifying these factors in terms of real cost benefits is the next challenge.

All photos courtesy of GSA Office of Governmentwide Policy, Office of Real Property.

If your organization produces a product or consumer service, performance measures are usually readily available. If you are involved in knowledge work—developing ideas—performance measures are harder to identify. Unfortunately, measurement of knowledge worker performance and how it is affected by the workplace is difficult, and the amount of available research, although growing, is still limited.

In either case, your team can review the criteria for success established at the start of the project and develop methods showing how things are progressing. Ideally, benchmark data from your organization, or similar offices, will provide you with performance measures you need and something to measure against.

Monitoring is the act of continuous observation of specific factors, such as customer satisfaction and worker morale, to see if they are the way you want them to be. Evaluation is a cyclical activity in which you measure whether certain expectations were met. Implicit with monitoring and evaluation is response. Don't forget that if monitoring or evaluations reveal a problem, a correction will be expected. Some of the purposes for monitoring and evaluation are:

> To determine if goals, objectives, and desired outcomes are being met (monitoring), or were met (evaluation)

> To determine if change management and transition management are or have been effective, and to determine areas that require refinement or adjustment

> To give people the opportunity to respond and react to the new office as part of their acceptance and ownership of it

> To be in a more responsive, proactive position as problems come up

> To ensure the overall success of the project

Monitoring and evaluation preparation should start at the beginning of the project—before its implementation. As the project moves forward and is completed, progress reports might cover:

> Effectiveness of change management

> Degree to which all aspects of the design were implemented

> Degree to which implementation occurred as scheduled and without mishaps

> Impact of problems on people and their work

> Other project outcomes (good or bad) beyond those specified by management

Some cautions in the monitoring and evaluation process include:

> Don't over-monitor or over-evaluate. Frequent inquiries can be disruptive and tiresome, as well as creating problems of their own. The process must be as convenient as possible

> Don't hesitate to use non-quantitative methods like interviews, discussion groups, anecdotes, etc

> Be sure that the entire project team, including consultants, change agents, employee representatives, and designers, have input into the monitoring and evaluation

> Try to monitor and evaluate all affected aspects of the project

The evaluation must accurately and adequately interpret two areas: outcomes and applications. For outcomes, you measure the extent that the organization's short- and long-term goals were achieved. For this to make sense, however, you need to evaluate the application—that is, you need to know if the project was carried out as designed or if deviations were made. This application evaluation is critical because application issues can have strong bearing on the outcomes. An appropriate concept and design can only yield the desired outcomes if properly implemented.

Consider the case where, after proper orientation and training, employees complain that work is being hindered by the lack of storage space. What do you do?

First, your benchmarks should tell you if performance has actually declined. If it has, consider whether employees are using the new processes around which the workspace was designed. Maybe more training is needed. Or, maybe the work itself has changed and the "new" work practices are already obsolete.

Perhaps the technology isn't adequately supporting the new way of working and employees are storing more in their work-

spaces than was originally envisioned. In all likelihood, the supporting technology simply needs to be modified.

It could also happen that employees are working in new ways, using appropriate technology to do their job – but it is their workspaces that need to be adjusted.

Once you are in your new workspace, it is easy to forget the dynamic nature of the Integrated Workplace. Post occupancy orientation, monitoring, and evaluation are your tools to stay current with best practices and to upgrade and adapt your office economically and efficiently. Think of your new office as the Beta version of "Workplace 1.0." Workplace 2.0 and 3.0 might follow immediately or in several years. Changes may be minor or sweeping. In either case, they should be the ones that best serve your mission, unhindered by the physical spaces in which they are carried out.

A Final Note on Procuring Your Integrated Workplace

Because of its complexity, the Federal procurement process too often becomes "the tail that wags the dog." It is important to remember that the requirements dictate the appropriate acquisition method – not vice versa. The array of contracts needed to successfully carry out a major project can be daunting. They may include service and supply contracts for information technology, organizational management, travel and transportation services, and furniture and equipment purchases; indefinite delivery/indefinite quantity contracts for telecommunications, security, environmental assessment, architect-engineer, construction and construction management services; design-build services; and other specialized procurements for design, construction, and leasing.

The sequential procurement of design and construction services most commonly used in the Federal Government is not conducive to an Integrated Workplace approach, where it is best to engage the entire project team early in the process. Your IW project manager and contracting officer need to "craft" an acquisition strategy that will allow the project team to focus on creation of the workplace without

worrying about the usual procurement process obstacles.

No single acquisition strategy will work in every situation. Examine each requirement and tailor your Integrated Workplace procurement accordingly. With an understanding of the available alternatives, the project manager and contracting officer can craft a strategy most appropriate to the project's cost, schedule, and objectives.

Recent implementation of the Government Performance and Results Act (GPRA), Federal Acquisition Streamlining Act (FASA), Information Technology Management Reform Act (ITMRA), and Federal Acquisition Reform Act (FARA) has broadened the number of procurement methods and Government contracts available for your use. Depending on the services and products required, you might need to simultaneously award multiple-contract purchase and work orders, or independent contracts.

The GSA Federal Supply Service (FSS) provides access to organizational management, business process, and information technology experts. Its IT schedule has products and services contractors who can provide systems analysis and design, installation, programming, networking, project management, records management, resource and facilities management, and database planning and design. See their homepage at http://pub.fss.gsa.gov/sched. Governmentwide acquisition contracts (GWACs) and multi-agency and agency indefinite delivery/indefinite quantity (ID/IQ) contracts also offer a large and varied selection of products, services, and contractors.

Design and construction service providers are available through your building manager and agency facilities office. GSA is also developing an Integrated Solutions Program to provide single-source delivery for all phases of space occupancy. This will coordinate, track and provide follow-up on all required services, including real estate planning, space design, furniture, supplies and equipment, telephones, computers, security, relocations, and special consulting.

THE INTEGRATED workplace

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Findings, Recommendations, and Next Steps

FINDINGS

The findings of this report, based on the research conducted, are as follows:

- The quality and suitability of workspace greatly affects the productivity and well-being of those using it.
- A clear definition of an organization's mission and goals and the work practices used to achieve them are prerequisites to developing the best workspace.
- Since people are the most important resource and greatest expense of any organization, the long-term cost benefits of a properly designed, user-friendly work environment should be factored into any initial cost considerations.
- Strategic organizational planning must include real property considerations and have participation from facilities professionals.
- Federal agencies need to keep informed of new workspace issues throughout the Government and the private sector.
- As Government organizations continually reinvent themselves to remain competitive and stay ahead of rapid changes in business and technology, providing workspaces with flexibility to adapt to change is the most critical factor in supporting new work processes and technology.
- Support from senior management is essential for successful implementation of an Integrated Workplace approach.
- The Integrated Workplace development process is a reiteration of good design practice that is comprehensive and primarily focused on the needs of the people and work processes rather than on space standards and furniture requirements.

RECOMMENDATIONS

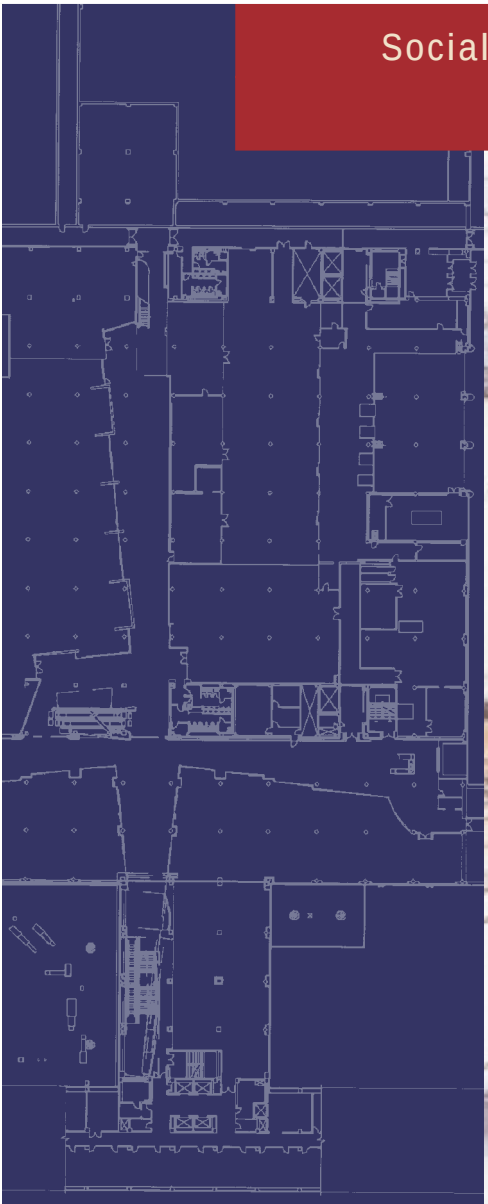
Based on the research and findings of this report, the following recommendations are offered:

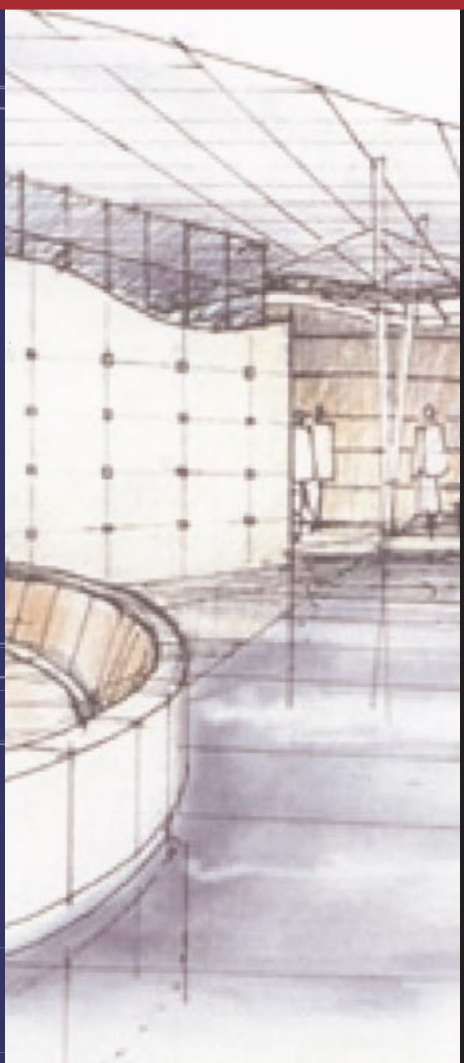
- All Federal agencies should promote and use Integrated Workplace practices in developing their workspace.
- Procurement requirements, management processes, and space standards or guidelines dealing with Federal workspace should be reviewed and amended, where necessary, to facilitate an Integrated Workplace approach.
- Senior management should be champions for better workspace.
- Budget and procurement decisions should encourage and support solutions based on a life-cycle model rather than a first-cost model.
- The Federal Government should promote and fund further research on the workplace, including the effects of the workplace and work practices on people's health, productivity, and job satisfaction.
- The Office of Governmentwide Policy should develop a method for sharing information on workplace issues throughout the Federal Government.
- The Government's successful Integrated Workplace solutions need to be recognized and rewarded.

THE INTEGRATED workplace

case study 7

Social Security Administration Headquarters





Social Security Administration Headquarters

Woodlawn, Maryland

Occupants

Social Security Administration

Design

Architects: Burt Hill Kosar Rittelmann
Engineers: HF Lenz
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Project Background

GSA, in partnership with the Social Security Administration (SSA), agreed it was time to update and renovate the existing SSA facilities, now over 30 years old, at its 281-acre complex in Baltimore, Maryland. As a start to the phased renovation of the campus, a Community Plan was developed to outline how best to renovate and/or modernize the complex over a 10-to-15 year period. It identified financial issues and long-term goals for GSA and SSA, and provided the basis of all future work.

During and since this effort, GSA has worked closely with the Social Security Administration management and staff to develop an understanding of the work ahead. Currently, over 1.5 million square feet of space is in various stages of development: Construction is 95% complete for one project, design has been completed for a second, with construction to start in 1999, and design of a third project is 95% complete.

Integrated Workplace Concepts Employed

People

> At the beginning of the project, GSA engaged SSA's staff, including management, to agree to the concept of a long-term, 10-to-15 year renovation of the campus.

> GSA worked with SSA to identify key individuals who would participate in all phases of the project to afford each consecutive phase the benefits of lessons learned from the previous phases.

> Project charters were developed to promote a team effort where everyone shared responsibility for successes and failures.

> The A/E (Architect/Engineer) consultants helped SSA project their future business needs and define the limitations of their current facilities.

> A "Facilities Center" was built on-site by SSA to provide everyone affected by the project access to a scale model of the entire complex and all project records, drawings, renderings and models. This area will eventually have a prototypical workstation with a computer that will show a digital walkthrough of the design and construction to date. The space also has a "round table" conference area where the teams can be seated face-to-face for better communication.

> Partnering sessions were held with the design team and users to discuss important issues.

Space

> In two of the projects, universal planning was utilized in 85% of the open office area.

> The client was not required to provide detailed housing plans 4-5 years prior to construction funding that would be of no value by the time construction began.

> The design includes a large amount of flexible, open office space capable of adapting to any future use.

> The existing facilities have few teaming/meeting areas. The new designs provide one "break out" area for 8 people at every 15-20 workstations, vending/eating areas dotted throughout the plan for informal gathering, and large and small conference rooms.

> Atria are utilized in the new designs to bring more light into the existing large floor plates. Some of the atria are independent areas; others are woven into pedestrian malls and pathways.

- Closed offices are limited only to directors and deputy commissioners and for the most part are located away from the exterior wall to allow more light to enter the open space.
- A combination of direct and indirect lighting is utilized, with an emphasis on task lighting to meet the lighting levels required by the Government guidelines
- New, larger windows using insulated glazing provide more openness and views to the wooded campus outside.
- Cafeteria areas are being opened up to the gardens and courtyards within the complex.

Technology

- Access flooring is being utilized in two of the three buildings currently underway to provide maximum flexibility.
- A flexible cabling, telephone, data, and power box system is dispersed under the access floor systems, making tie-in for future changes quite easy, regardless of the space plan.
- A fiber optic Lan/Wan system is being designed by the A/E to ensure that construction of the facility and its systems fall under one general contractor, improving coordination and establishing overall responsibility.
- The heating, ventilating, and air conditioning systems are designed to ensure excellent indoor air quality, providing healthy amounts of fresh air with a great deal of system flexibility.

Project Results

(best practices, lessons learned, benefits gained)

- Because of the working environment GSA and SSA developed in the early planning stages of the project, the client was more willing to consider state-of-the-art and fundamentally different design concepts.
- It is sometimes difficult for a building tenant to move away from familiar practices and facilities into new, “uncharted waters,” even when they know it will benefit them.
- Even though the project is not yet complete, it appears that the approach to planning ahead (Master Plan, Community Plan, etc.) was invaluable in getting SSA to visualize their future business needs and work practices and in showing them how those needs can be translated into the physical space.
- Not requiring SSA to do space planning 4 or 5 years in advance of the project construction eliminated a lot of frustration and rework.
- Using a long-term construction manager contract during design and construction allowed GSA to have several people involved with all the projects, providing continuity and transfer of lessons learned.
- Design and construction partnering sessions have been utilized with success in getting project buy-in and understanding from all design team members.

All drawings by Burt Hill Kosar Rittelmann Associates courtesy of GSA Public Buildings Service.

NEXT STEPS

The Office of Governmentwide Policy's Integrated Workplace Program

Issuing this report is the first step in developing a program to support Federal agencies in workspace development. The Office of Governmentwide Policy will also develop follow-on programs to support and promote the Integrated Workplace. They will include:

Workplace Information Clearinghouse

As a follow-on to this study, the Office of Governmentwide Policy will develop an Internet-accessible web site that will share information and available resources with agencies that wish to develop Integrated Workplace solutions. Features of this site will include:

- A copy of this report, which can be downloaded and printed for use by anyone
- Periodic updates of the Integrated Workplace Report
- Listing of projects that utilize Integrated Workplace solutions and share lessons learned
- Links to workplace-related sites
- List of upcoming events relating to the workplace
- Listing of current research, technology, and expertise

Education and Marketing Program

This follow-on program will develop training and marketing tools to educate those involved in or affected by the workplace on Integrated Workplace issues. It will include:

- Development of education materials to promote Integrated Workplace concepts
- Review of construction procurement practices and how they affect workplace development
- Identification and development of training for management, users, and workspace professionals on developing Integrated Workplace strategies
- Sponsorship of forums and workshops on work-related issues

APPENDIX A — GLOSSARY OF TERMS

Building Infrastructure—All the basic physical elements and utilities that service the building and create the space used by the people. These include the building structure, envelope, walls and partitions, building systems and utilities, and service equipment.

Building Systems—The part of the building infrastructure that includes mechanical systems (heating, ventilating and air conditioning systems, water, and sanitary systems), electrical systems (power, lighting, and communications), and other systems such as elevators.

Churn—The rate of workspace occupant relocations within an organization, usually shown as a percentage of relocations per total workstations per year.

Cubicle—A common term for the semi-enclosed, individual work stations in open-plan furniture installations.

Ergonomics—The science of fitting the job to the worker so that the people and things interact efficiently and safely. This requires proper arrangement of your workspace and tools that fit the worker.

Expert Systems—A computer program that acts like an expert consultant in predicting the outcomes of events or diagnosing problems. It does this by manipulating large databases using structured rules to draw its conclusions.

Free Address—Undedicated workspace that is available for use by anyone without prior reservations.

Hoteling—Shared workspace that is assigned through a reservation system similar to that used by hotels. To be successful, it must have sufficient support to minimize reservation and setup time. A person needs to be able to arrive and start working quickly.

HVAC (Heating, Ventilating, and Air Conditioning)—The mechanical system components of a building designed to control the building temperature and provide fresh air to keep the occupants comfortable and healthy.

Integrated Workplace—A comprehensive, multidisciplinary approach to developing and providing workspace that addresses the business goals, work practices, and physical space of an organization and the technology needed to support them.

Knowledge Work—Work that involves the use of information and creation of ideas rather than making a product and usually requires specialized, formal education. Peter F. Drucker coined the term in 1959.

LAN (Local Area Network)—An interconnected group of computers within a single building or group of buildings, linked together through a system that allows communication and information sharing both within the organization and, usually, with other organizations.

Mobile Office—Technology that provides the necessary tools to allow a person to work in remote settings away from a fixed office, such as in a car, airplane, hotel room, or restaurant.

Moteling—Office space that is provided to occasional users on an as-needed basis, usually assigned upon arrival, and usually consisting of a small work area that provides the needed tools and connectivity.

MSD's (Musculoskeletal Disorders)—A type of injury affecting muscle or bone, such as carpal tunnel syndrome, that can be caused by repetitive, work-related processes such as typing on a keyboard.

Organizational Culture—The characteristics of an organization such as shared work values; formal and informal practices, policies, ideas, and expectations involved in an organized workplace; ways of communicating and relating; and ways of getting work done.

Project Development Team—All the people tasked with providing new workspace, including the in-house steering committee and all professional consultants.

Satellite Offices—Remote workspace that provides all necessary work facilities and tools common to the organization's main office. These facilities give people options to work closer to home and reduce commuting needs and can be space that is shared by different organizations and people with them or dedicated for use by particular groups. Usually involves some sort of hoteling or free address arrangement for workspace.

Shared Offices, Desk Sharing, and Shared-Assignees—Two or more employees use the same work area in ways that avoid conflicting purposes.

Steering Committee—The in-house portion of the project development team whose members should represent all the organization's interests in space development.

Systems Furniture—Work surfaces, storage units, and other elements, usually hung from freestanding panels, that can be arranged to form a complete office work setting.

Teaming Areas, Team Suites, Group Addresses—Highly collaborative areas that are used for group efforts. These can be assigned and used for the life of a particular project, or used for shorter periods of time on a reserved or non-reserved basis.

Telecenters—See Satellite Offices.

Telework, Telecommuting—An alternative work strategy in which employees work at home either full or part-time.

Universal Workstations or Universal Open Plans—A modular approach to office planning where workstation sizes are the same or vary in size by standardized increments that allow interchangeability of spaces to allow people to move with minimum changes to the space.

Virtual Office—(also see mobile office) Workspace that is disassociated from a specific time or place so that people work wherever appropriate, with no formal office space provided.

WAN (Wide Area Network)—A group of two or more LANs in different areas connected to each other so they operate as one system.

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APPENDIX C — RELATED LEGISLATION

Below is a list of legislation that involves workplace issues, excerpted from the Office of Real Property April, 1998, publication entitled General Reference Guide for Real Property Policy:

1. *Americans with Disabilities Act of 1990 (P.L. 101-336, 104 Stat. 327)* Provides, among other things, accessibility requirements on employment, State and local government services, buildings, and facilities.

2. *Energy Policy and Conservation Act (EPACT) (42 U.S.C. §§6201 et seq.)* Requires Federal agencies to implement programs that reduce energy consumption in Federal facilities.

3 *Executive Order 12072—Federal Space Management* Requires Federal agencies to give first consideration to the Centralized Community Business Area when locating Federal facilities in urban areas.

4. *Executive Order 12411—Government Work Space Management Reforms* Requires the heads of Federal Executive agencies to establish programs to produce and maintain an inventory of work space and related furnishings, reduce the amount of work space used or held to essential minimums, and report to the Administrator of General Services any holdings not necessary for the mission of the agency.

5. *Executive Order 12512—Federal Real Property Management* Directs GSA to provide Governmentwide policy oversight and guidance for Federal real property management; to establish standards and procedures for Federal agencies' review of their real property holdings; to conduct utilization surveys; and to provide leadership in the development of property management information systems.

6. *Executive Order 12902—Energy Efficiency and Water Conservation at Federal Facilities* requires that appropriate consideration be given to building efficiencies in the leasing process.

7. *Federal Property Management Regulations, Subchapter D, Public Buildings and Space, Part 101-17, Assignment and Utilization of Space (41 CFR Subchapter D, Appendix, Temp. Reg. D-1* Prescribes the procedures for the assignment, utilization, and location of Government-owned or leased space under the authority of the Administrator of General Services.

8. *Federal Property Management Regulations, Subchapter D, Public Buildings and Space, Part 101-20, Management of Buildings and Grounds (41 CFR Part 101-20)* Prescribes the procedures for the management, operations, protection, and maintenance of Government-owned and leased properties under the assignment responsibility of GSA.

9. *National Historic Preservation Act of 1966, as amended, (16 U.S.C. §§470 et seq.)* Requires Federal agencies to manage historic properties under their jurisdiction or control and to consider the effects of their actions, including ongoing facility management, on such properties regardless of ownership.

10. *Occupational Safety and Health Act of 1970 (29 U.S.C. §§651-678)* Requires GSA to ensure that space leased and assigned to Federal agencies provides safe, healthful working conditions, including building features such as lighting, guard rails, indoor air quality, fire safety features, emergency elevator requirements, etc.

11. *Public Buildings Act of 1959, as amended (40 U.S.C. §§ 601-619)* Provides that only the Administrator of General Services may construct public buildings, including the repair and alteration of such buildings. Establishes requirements for the acquisition, alteration, and construction of public buildings.

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The Integrated Workplace: A Comprehensive Approach to Developing Workspace

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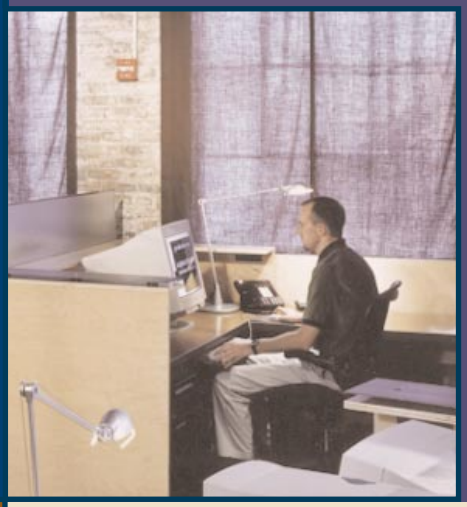
People



THE INTEGRATED workplace

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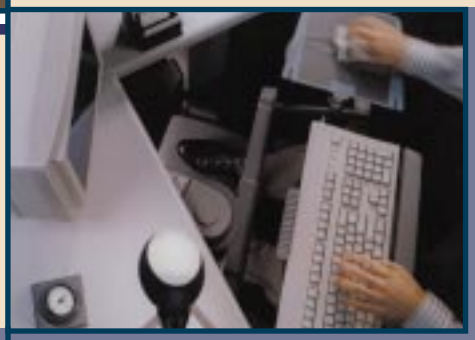

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