Best Practices for Space Management

By Michael Schley
Introduction

Understanding space is a critical component of effective facility management practices. It is the foundation for occupancy management as well as move management, strategic planning, room reservations, facility maintenance and real estate management. The purpose of this guide is to share the best practices that have developed in the profession over the past several decades, explain key decisions that organizations must make and discuss current trends in the use of workspace.
Benefits of Space Management

Space is at the heart of facility management and effective space management is key to professional facility management. Understanding the types of spaces within a real estate portfolio and knowing how they are used is essential in a well-managed facility operation.

A good space management system will provide three major benefits:

**Efficiency**
Information about how space is being used or not used provides the basis for decisions on expansion, reduction or changes. These actions can produce major savings in real estate expenses by reducing wasted space and producing a better fit between space demand and supply.

**Effectiveness**
Information about how space is occupied provides guidance for departmental assignment, allowing work groups to work in proximity in space suitable to their tasks. Knowing locations of available workspaces supports a smooth on-boarding process for new employees and avoids the frustration of having to search for empty desks.

**Foundation**
The information collected for space management will serve as the base for most other functions in facility management including move management, facility maintenance and strategic planning.
A good space management system will provide a facility manager with essential space information for benchmarking against other organizations, planning for future growth and evaluating a building’s efficiency. We find that there are ten key measures of space that every facility manager should know.

1. **Total Area**
   Although a more detailed breakdown of space is useful, knowing at any given time how many square feet or square meters an organization uses is essential information. The choice of area measurement will depend upon the type of facility. Gross square feet or square meters are useful for all building types. For office buildings, rentable square feet or square meters are equally useful.

2. **Capacity**
   The number of office and workstation seats in a facility. This is a measure of the number of occupants that can be assigned in a given building.

3. **Occupant Count**
   The number of occupants assigned to a given building.

4. **Occupancy Rate**
   The percentage of seats assigned to occupants. The calculation is produced by dividing occupant count by capacity.

5. **Vacancy Rate**
   The percentage of seats not assigned to occupants. The calculation is produced by subtracting the occupancy rate from 100%.
6. Planned Density
The average square feet or square meters per seat. The choice of area measurement will depend upon the type of facility. For office buildings, rentable square feet or square meters are recommended since the results can be compared to published benchmark surveys. For other building types, gross square feet or square meters would be more applicable. The measurement is calculated by dividing the total area of a building by the building’s capacity. A related calculation is “actual density,” which is a measure of average area divided by occupancy.

7. Space Assignment by Occupant
A list of all occupants and their assigned workstation or workstations.

8. Vacant Seats
A list of office and workstation seats not currently assigned to occupants.

9. Space Assignment by Department
A list of all departments and their assigned workstations and associated square feet or square meters.

10. Open Plan/Closed Office Percent
The number of open-plan workstations divided by the total number of seats (including offices, desks and open-plan workstations) in a given building.
Space Inventory Data

Space management systems comprise of two major information systems: space inventory and occupancy. The starting point in implementing a space management system is to define space inventory data.

Space Inventory describes the physical facilities and includes sites, building, floors and spaces. Generally speaking, space inventory is separate from information about the organization and individuals occupying the space.

**Space Inventory — Hierarchies**

The hierarchy of information will vary by each organization, but at the simplest, space inventory would be defined by a four-level hierarchy as follows:

For organizations who hold large real estate portfolios in many locations, a fifth level of hierarchy above the site level might be added. A hierarchy for a large national or multi-national corporation might look like this:

**Decision:** A company implementing a new space management system should evaluate their requirements for tracking buildings. Organizations with many buildings should consider utilizing the site definition and possibly adding an additional level of hierarchy above that.
Coding Systems for Unique Identification

In any information system, every element needs a unique identifying code. This is certainly true of space management. An organization implementing a system will at a minimum need to select or define a coding or numbering system for the following elements:

Coding for Buildings

In some situations, a real estate department already has a coding system for buildings. Generally, there will be an advantage to using the same codes. In this case, attention should be given to who assigns codes for new properties to avoid confusion. There may also be a system already in place used in Human Resource or Enterprise Resource Planning (ERP) systems for employee locations. These should be considered for use, but carefully evaluated to ensure that buildings are clearly differentiated and that there is an organized method for assigning codes to new buildings.

If there is no existing coding system for identifying buildings, the facility management department will have the task of creating a system. Since these codes will be part of the address of space ID’s and used in many functions, a recommended best practice will be to keep the code short and, if possible, logical. For an organization with buildings in multiple states, a two-character code designating state or city followed by a two-digit sequential number might be considered. For example, “NY10” might indicate the tenth building in New York. “LA32” would be the 32nd building in Los Angeles. Another approach is to use street addresses such as “12BS” for 12 Broad Street.

Coding and Spaces

In space management systems, the most basic spatial element is the space. This might be a room, an open-plan workstation, a stair, restroom, elevator, hallway or possibly even a pipe chase. In FM:Interact, each of these spatial elements is considered a space.

Space ID codes are necessary to uniquely identify each space. All rooms, workstations and other spatial elements require numbers or codes. If an identification system already exists, it will be advantageous to use it. It may be necessary to define additional codes or numbers for open-plan workspaces, closets and other rooms that are not numbered. Adding a letter suffix is a logical way to do this.
Space ID codes must be unique by building. They may repeat between buildings since the full address is the building code followed by the space code. For example, we might have “NY10 1000” in New York and “LA32 1000” in Los Angeles.

Generally speaking, space ID codes will start with the floor code. This is common practice and supports the assumption that most people will make. For example, most people would assume that room 23050 is on the 23rd floor. Again, there should be only one room 23050 in a given building.

When defining a space identification system on a floor, a best practice is to be mindful of wayfinding, running sequential numbers along a main corridor much as one would find in a typical hotel. Numbers or codes should have gaps to allow for future spaces being added by reconfiguration. For example, a sequence of spaces numbered 23050, 23055, 23060 and 23065 would allow for future spaces 23052 and 23062. Letter suffixes can also be used, particularly for groups of open-plan workspaces. For example, 23050A, 23050B, etc.

An alternate method of assigning space ID codes is to use a grid numbering system with a letter indicating one axis of the grid and a number indicating the other axis. For example, 23-C2-15 indicating a space on the 23rd floor, column Bay C2, space 15. Although this is quite orderly, it may not be helpful to visitors since many people understand space experientially rather than visualizing space as a floor plan or map.

**Decisions:** The organization implementing a space management system must determine systems for uniquely coding buildings, floors and spaces.
Classifying Space — Space Types

Remembering that spaces serve a range of functions, attributes are used to designate general classifications of space. For some facility types such as higher education, an industry-defined system for space classifications exists. In the United States, colleges and universities use the Facilities Inventory and Classification Manual (FICM) coding for classifying space according to use.

For office space, there is no generally accepted classification system. Space classification systems have been developed by Omniclass (Table 13-Spaces by Function) and by OSCRE. However, neither standard has yet to see significant adoption. Furthermore, the OSCRE standard is not a public standard and is available only to companies that have paid to join OSCRE.

FM:Systems recommends a practical classification system that is easily understood. In FM:Interact, the system is implemented using the Space Type field in Space Inventory and it is a required field for all spaces. The list of valid Space Type values uses an initial letter of “P” for personnel space, “S” for support space and “X” for core or building support space. The partial list below shows typical space type codes for office facilities.

- **P-OFFC**: Office
- **P-WKS**: Workstation
- **S-CONF**: Conference Room
- **S-BREAK**: Break Room
- **S-LOBBY**: Lobby
- **X-ELEV**: Elevator
- **X-STAIR**: Stairway
- **X-WALL**: Exterior Walls

**Decision:** The default list is a suggested starting point. The organization implementing a space management system should modify this to accommodate the particular spaces in the organization’s facilities.
Understanding Space Measurements

Over the past fifty years, the commercial real estate and facility management professions have developed generally accepted concepts and terms for space. In office space, the most widely known standard is defined by the Building Owners and Managers Association (BOMA). The purpose of the BOMA standard is to define the area for which a tenant pays rent.

The three key measurements defined in the BOMA standard are:

- Gross Area – The area within exterior walls.
- Rentable Area – The calculated area for which a tenant pays rent.
- Usable Area – The area on a multi-tenant floor that defines a tenant's premises.

Although the BOMA standard was developed to support leased space, the measurement system is also commonly used by buildings that are owner-occupied since it supports comparisons to industry benchmark data.

The International Facility Management Association (IFMA) has supplemented these concepts with one additional measurement:

- Assignable Area – The area of a workspace or room.

The diagram below shows an approach to understanding office space.
The respective standards define slightly different methods of measuring office space, and the organization implementing space management will need to decide on standards for polylines, the boundary lines used to measure and define each space. This is explained in Appendix 1.

For college and university space, particularly in the United States, the recommended standard is the Facilities Inventory and Classification Manual (FICM) standard defined by the U.S. government. FICM defines the following organization of space:

For colleges and university spaces outside of the United States, local country standards should be used where applicable. Where country-specific standards do not exist, FM:Systems recommends using the FICM standard. This will facilitate benchmark comparisons with a large number of universities in the United States.

For academic healthcare facilities that are part of universities, the FICM standard is usually recommended. For non-academic healthcare facilities, an expansion of the space type codes for office buildings may be more logical. Industry practice in this area is still evolving so there is no space classification currently in common use for these facilities.

**Decision:** *Determine which area measurement standard is to be used.*
Graphic Sources for Space Inventory — CAD and BIM

Generally speaking, space inventory should originate with a graphic source, specifically Computer-Aided Design (CAD) or Building Information Modeling (BIM).

Virtually all buildings for the past twenty-five years have been designed with either CAD or BIM. The dominant provider of both CAD and BIM software has been Autodesk with their AutoCAD and Revit products. Because of Autodesk’s market position, other vendors of CAD and BIM software generally provide capability for exporting graphics to the AutoCAD format or to neutral formats readable by AutoCAD or Revit.

FM:Interact supports AutoCAD and Revit using program extensions that connect the AutoCAD drawings or Revit models directly to the FM:Interact database. Hence when changes are made in AutoCAD or Revit, the data is immediately updated in the FM:Interact system. Graphic floor plans are updated by way of a publishing process that the user does when changes are made to floor plan graphics. In FM:Interact, markup functions usable within the browser can also be used to effect changes in AutoCAD or Revit.

Incidentally, it is not uncommon for areas measured on CAD drawings to differ from rentable areas specified in leases. In these cases, it is important to first understand that the rentable area in lease may include an allocation for common space and can therefore not be readily compared to the measured area of a leasehold premise. Furthermore, the area in the lease may not be based on accurate information and there might be reason to undertake a re-measuring of space. Where calculations do vary, we generally recommend that area based on CAD drawings be used for space management purposes with the area according to the lease agreement tracked in the system, but not used for system calculations.
Preparing AutoCAD Drawings for Space Management

Implementing a space management system requires accurate, organized and consistent CAD drawings. Although some organizations may already have a good system for achieving this, FM:Systems will typically find that organizations need to undertake this as a project as part of the implementation work. In those cases, the general steps are as follows:

1. Identify and locate CAD drawings for each floor of the portfolio.
2. If necessary, establish naming and file storage conventions for all drawings.
3. Review all drawings for accuracy with respect to walls, doors, columns and workstation boundaries (open-plan workstation panels).
4. Establish CAD layer guidelines and bring all drawings into reasonable conformance.
5. Decide if reference files will be maintained for related disciplines. If so, establish a naming and filing convention for all reference files and bring reference files into conformance.
6. Determine the version of AutoCAD to standardize on and update all drawings to that version.

Add boundary lines known as polylines around all rooms, workstations and spaces, placing lines in accordance with the area measurement standard selected. See Appendix 1 for specific information.

Clearly, establishing the system for CAD drawings may entail a good amount of effort. It is an important part of the process though, and a well-managed system of CAD drawings will provide great value in the future as the graphic base for all space management activity.

This is an activity that can be contracted to a CAD services firm. Where the work is substantial, FM:Systems recommends using a service firm to avoid delays in implementation. It is worth noting that the work described in the seven steps above can be achieved without connection to the FM:Interact database, making it easier to contract this work to service providers who specialize in CAD or BIM services.
Preparing BIM Models for Space Management

A trend is underway for most new buildings to be designed and constructed using BIM instead of CAD. This is making it possible for facility managers to base their space management data on BIM models rather than CAD drawings. Since older buildings may not be represented with BIM, many facility managers will use a combination of BIM and CAD in their space management systems.

BIM models will usually require preparation for use in a space management system. If the BIM model was used for construction, we recommend removing views and notes that were used to construct the building but are not needed for ongoing facility management. Essentially, this is transforming the construction BIM model to a facility management BIM model. Where linked models were used, consideration should be given to consolidating models for easier management. The goal is to simplify and streamline the model for faster access and easier management.

Similar to CAD drawings, it is necessary to define the boundaries of offices and workspaces and to identify those with identification codes that are unique by building. It is also necessary to define what the FM:Interact system calls “graphic views.” These are definitions of building elements such as walls, doors or furniture that will be displayed in various settings.

![Space plan graphic view](image1)

![Space types graphic view](image2)

Finally, building equipment that will be managed as part of facility management operations must be identified and linked to the facility management database. Building equipment of interest would typically include major mechanical and electrical equipment.
Using Space Types to Designate Shared and Prorated Space

As discussed previously, space management entails the definition of several groupings and calculations of space. For office space, these are Gross, Rentable, Usable and Assignable. For college and university space, these are Gross, Net Assignable, Building Service Area, Circulation Area, Mechanical Area and Structural Area.

In FM:Interact, these calculations are driven by designation of certain space types as common spaces. For example, in calculating Rentable Area using the BOMA standard on a multi-tenant floor, each tenant receives a share of the common spaces serving all tenants on a floor, such as common circulation, toilet rooms and mechanical rooms. Depending on the version of the BOMA standard being used, there may also be allocations for common areas shared by the entire building, such as the main floor lobby.

**Decision:** The organization implementing a space management system will need to decide how common spaces are allocated within buildings.

Populating the Space Inventory Database

Once basic decisions have been made about coding for buildings and floors, space types and area measurement standards, an organization can begin data entry for the key space inventory elements of the system. This is logically done as follows:

**Region and Site Codes** – If additional hierarchical levels have been defined for grouping buildings such as sites or regions, values for these tables should be entered.

**Building Codes** – Values for identifying code, description and optionally address should be entered for all buildings. For organizations with a large number of buildings in their real estate portfolio, this might best be done by data import.

**Floor Codes and Drawing Names** – Values for all floors for all buildings should be entered along with the name of the associated CAD file.

**Space Types** – The default space type list should be edited as appropriate.

**Room and Space Data** – This data is based on CAD floor plans or BIM models with CAD or BIM defining the geometry of each space and the space management database being the authoritative source on various attributes of the space.
Space and Room Attributes

Space ID
Each space or room needs an identification number or code that is unique by buildings.

Space Name
This information is useful to understand the character and purpose of a space, particularly when the space type and space standard codes are not obvious. The name should be general in nature, such as not to imply a specific department or occupant. In other words, the field should have values such as “Office” or “Conference Room” rather than “John Smith Office” or “Finance Conference Room.”

Capacity
An essential attribute of each space is its capacity for assignment to occupants. When totaled, this will tell us the capacity for occupancy by floor, building, campus or organization. Matching this against the total occupancy will tell us the number of unassigned (vacant) workspaces.

The capacity for meeting rooms should be tracked in a separate field so as to not be confused with workspace capacity.

Generally, the capacity value of an office or workstation will be 1, but in the case of a shared office, the value could be 2 or greater. In the case of a workstation that is not meant for assignment, such as a visitor’s station, the capacity might be set to 0.

In cases where workspaces are used for multiple shifts, the capacity of the space at a given point in time should be used. For example, a desk that is used by three different people on three different shifts should have a capacity of 1 since only one person can occupy the space at a time.
Space Standards

Most facility managers employ the concept of space standards to define typical workspace layouts. By simplifying the variety of workspace layouts used, it becomes easier to relocate occupants without the need to reconfigure furniture. Space standards are not intended to be precisely identical but should be generally of the same size and layout.

Space standards are a classification of space that is more specific than Space Type. For example, a facility might have three standard types of private offices. They would all be classified with the same Space Type code, let us say “P-OFFC,” but would have different space standards. Coding for space standards is up to the user, but a typical coding scheme is shown below:

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>Large Private Office</td>
</tr>
<tr>
<td>A2</td>
<td>Medium Private Office</td>
</tr>
<tr>
<td>A3</td>
<td>Small Private Office</td>
</tr>
<tr>
<td>B1</td>
<td>Large Workstation</td>
</tr>
<tr>
<td>B2</td>
<td>Small Workstation</td>
</tr>
<tr>
<td>C1</td>
<td>Large Conference Room</td>
</tr>
<tr>
<td>C2</td>
<td>Medium Conference Room</td>
</tr>
<tr>
<td>C3</td>
<td>Small Conference Room</td>
</tr>
<tr>
<td>P1</td>
<td>Large Project Room</td>
</tr>
</tbody>
</table>

Judgment should be used to keep the list specific enough to be informative, but not so detailed that it becomes unusable. The intent is that a system user can judge the adequacy of a space based on the space standard code and be able to associate various job positions with appropriate space standards. For example, a facility might have several types of small offices ranging in area from 100 square feet to 120 square feet, but designate them all with the same space standard.

Customer-Specific Attributes

Organizations will often have other attributes related to space inventory that are relevant to their particular businesses and workflows. These attributes might be applicable to spaces, floors, buildings, sites or other elements of the space inventory data tables.

FM:Systems encourages users to implement these special attributes, but judgment should be used to ensure that the data will be maintained and updated. Users should remember that while it may be quite easy to define custom fields, there is ongoing effort needed to populate the data and keep it accurate. Since custom fields can be added at a later time without penalty, it is often best to start with less information rather than more.
Occupyant Data

The second major information system in space management is Occupant Data. Occupant Data comprises data on all individuals in the organization and all organizational units.

**Defining the Organizational Hierarchy**

The organizational hierarchy is a standard way that companies use to understand the relationship between functional units. This information is used to produce roll-up reports that summarize space by higher levels of the organization and graphic floor plan views that depict rollups visually.

**Creating the Organizational Hierarchy**

The organizational hierarchy is ideally created by data import. The most common source of data is the finance department that maintains the list of all valid organization codes. These might be called cost centers, organizational ID’s, department codes or some other term. The essential characteristic is that they provide a unique code and description for each organizational unit. Generally, these sources of data will also contain data on the reporting structure. Part of the implementation process is to create a routine that will import this data on a regular basis, updating codes as they are added or when the reporting structure changes.

**Defining Attributes for Occupants**

Data about people is at the heart of occupancy management. The space management system must include a list of all individuals who occupy space.

This data is almost always available from an external source and it should be obtained through a data import routine. Since the data is dynamic, the import routine should be run regularly, ideally nightly. In theory, import routines could be run more often or even in real-time, but practically speaking there are natural lag times in the entry of personnel data at the source that makes a daily import the most practical.

**Unique Identifier**

Just as with buildings, floors, spaces and groups, occupants need unique, stable identifying codes. This allows us to retain data about a person even if their name, department or position change.
Defining Attributes for Occupants

It usually makes sense to track any occupant attributes available from the source data that might be relevant to space management. At a minimum, these would include:

- Employee ID
- First and Last Name
- Email
- Phone Number(s)
- Title
- Department or Organization Code
- Network User Name where the occupant will also be a user of the system.

Job Code Attribute

Some organizations track employees by a job code or classification that is associated with a space standard. This is valuable information since it can be used by the facility manager to evaluate the best space assignment. This is done by associating each job code with a space standard. In organizations where the job codes do not relate to space standards, the codes can still be useful information.

Contract and Temporary Employees

Typically, the list of occupants of a building who are regular employees can be obtained by way of a data import or integration with an organization’s human resources (HR) system. Occupants who are contract employees or temporary employees may be missing from the HR list. Additional data feeds from the network login directory system or the security badge system can often be used to produce a complete list of occupants. When these systems are not available or not suitable, users may need to maintain the list of contractors and temporary employees by manually editing the occupant list.

Remote Employees

There may be value in tracking remote employees in the system. In these cases, a “pseudo” building code designating a general remote location can be used.

Location Attribute

An important attribute that typically does not exist in external data, at least not in a reliable state, is the employee location. In other words, we must find out who sits where. The FM:Interact system uses the employee Space ID fields to track this information. Part of the process of implementing a space management system is the task of determining and entering data on employee location. A recommended practice is to use the help of departmental liaisons, tasking them with using the floor plan view to associate employees in their department to workspaces. Special attention should be paid to individuals who have multiple space assignments. Another method is to collect initial data in a spreadsheet, then use a data upload function to populate the location attribute.

We do sometimes encounter HR systems that carry employee location data. This information can be useful as a cross-check, but typically has a low degree of accuracy. Furthermore, location values are typically not validated against a list of valid locations, so there is usually a good amount of invalid data. A recommended practice is to import this attribute into a location reference field that can be used for information but not used as validated data.
Keeping Space Management Data Accurate

Information in space management systems needs to be maintained if the systems are to be useful. Information changes over time, and it is essential to establish procedures for updating data.

Buildings and Floors

Changes to buildings and floors are fairly infrequent. Updates can be done on an as-needed basis. A procedure should be established for “on-boarding” a new building since other corporate data systems may be affected. A procedure should also be established for adding new floors, in particular with respect to CAD drawings or BIM models.

Updates to Spaces

Changes that entail reconfiguration of walls, doors or open-plan furniture panels should be done in the source CAD floor plan files or source BIM model. Once the change is made in the floor plan graphics, floor plans should be re-published to establish accurate floor plans in the space management system.

Updates that entail changes in space attributes or classifications can be done in CAD or BIM, but updates can also be done directly in the space management system. In the FM:Interact system a user could make these changes in the data view or the floor plan view.

Employee data and organizational hierarchy data should be maintained with regular data imports. Employee location data is best maintained by using move management software that uses move events to update occupancy data.

Associating Spaces with Organizational Units

Besides associating spaces with occupants, it is important to associate spaces with organizational units. In most cases, the occupant’s group and the group to which the space is assigned are the same. In other words, if John Smith in Finance is assigned to workspace 5102, space 5102 would generally be associated with the Finance department.

Users will need to specifically assign support spaces like project rooms and dedicated conference rooms to groups. Users will also need to manage spaces that are shared by several groups, specifying the percentage of the room associated with each respective group.

Users also need a way to deal with exceptions — cases where the space is charged to a different group than the assigned occupant.

Color-coded floor plans are a tremendous aid in communicating departmental space assignments and obtaining confirmation or corrections of these assignments from the departments occupying the space.
Chargebacks

Many organizations calculate the space used by each department and produce internal charges to each department for the space the department uses. Chargeback systems can result in departments using space more responsibly and provide an incentive to give back space that is not needed.

Some organizations that do not use space chargebacks still find value in calculating and reporting the cost of space by department to better communicate the expense of occupancy.

Chargeback systems require well-defined processes and procedures. Among the issues to be determined are:

- What is the frequency for calculating chargebacks? We find that a monthly cycle is the most common.
- What types of spaces will be considered prorated common spaces and included in the space charge?

Our experience is that most support spaces like conference rooms are included in the chargeback. Special purpose areas like cafeterias, training facilities and data centers are not prorated as common areas but charged to their respective cost centers.

- What information needs to be provided to departmental managers so that they can verify their occupancy?

Generally, a monthly report including a color-coded floor plan is a good practice for communicating space that is charged to each department.

A benefit of a chargeback system is that the space charges serve as an incentive to keep data accurate. Organizations that use their space management systems for chargebacks should make sure that the group codes used in the organizational hierarchy support the accounting needs of the chargeback system.
Recommended Reports and Metrics

Defining the list of standard reports and metrics starts with identifying the key counts or calculations and providing a clear definition of the measure.

**Metrics**

We generally recommend tracking the following metrics:

- **Rentable Square Feet or Square Meters for Office Space** – This is the most common way of understanding a building’s useful area and is commonly used in industry benchmarks.

- **Occupant Count** – The number of people with assigned office and workstation seats in a building or floor.

- **Capacity** – The number of assignable office and workstation seats in a building or floor.

- **Vacant Seats** – The number of office and workstation seats that are available for assignment to an occupant but that are not currently assigned.

- **Utilization** – The number of occupants using a building, floor or space at a given point in time.

- **Assignable Square Feet or Square Meters for Office Space** – The areas of offices, workstations or other spaces without allocation of common space.

- **Net Assignable Space for Universities** – The areas of classrooms, laboratories, offices, dormitories, meeting rooms and other functional spaces without allocation of common space. This is defined by FICM.

- **Gross Square Feet or Square Meters** – The total area of a building or floor measured from the outside of exterior walls. This is applicable where space is owned and less applicable for rented space.

- **Cost Measures** – Measures of facility costs that will generally include rent, utilities, taxes, insurance and maintenance. Cost measurements should be carefully defined so that the user understands which costs are included or excluded and can make fair comparisons between buildings.
Although each organization will have unique reporting needs, most will be well served with the following reports:

- Vacancy by Count and Square Foot or Square Meter
- Departmental Occupancy by Square Foot or Square Meter
- Cost per Square Foot or Square Meter by Site
- Planned Density – Average Area of Office and Workstation Seats
- Occupancy Rates by Building
- Space Types per Floor
- Remote and Non-Remote Workforce
- Average Office and Workstation Areas

Emerging Trends in Space Management

Shared Workspaces and New Ways of Working

Mobile technology has made it possible for many people to work anywhere, anytime. Remote workers have become common, and efforts to achieve better work-life balance have resulted in many employees working remotely on an as-needed basis. The relatively low use of offices and workspaces have caused many organizations to re-think the premise of one workstation per employee. Given the fact that on any given day a large number of employees are “not at their desks,” many organizations are experimenting with shared workspaces. Some companies have reported dramatic cost savings. In one case, a pharmaceutical company was able to cut their real estate holdings in half.

The terminology for this approach to occupancy is still unsettled, but practices are often described as flex space, agile workspace, shared desking, alternative workspace and activity based workspace. We suggest the term “agile workspace” to describe this practice, but we also endorse any term an organization chooses to describe these new approaches to space management.

While few organizations have moved completely to an agile workspace, many companies are either piloting some form of non-assigned workspace or have designated parts of their workforce as mobile workers.

In addition to reducing real estate footprints, there is an argument to be made that this less structured approach to occupancy results in breaking down departmental silos and enhanced collaboration.

Neighborhood Concept

A practice for bringing some order to the practice of non-assigned seating is the neighborhood concept. Space is delineated into zones or neighborhoods and assigned to groups of occupants. The practice has the benefit of keeping work groups in proximity. By establishing ratios between seats and occupants, the facility manager can monitor the adequacy of the space assignments. Groups that engage in frequent travel would have low ratios, as low as 1 occupant:2 seats. Groups doing administrative work might have a 1:1 ratio.

Metrics for Agile Workspace

The new flexibility in using space results in some complexity in how we understand the quantitative measures of space use. We suggest adopting the following additional measurements to understand the new workspace environment.
Mobility Ratio – The ratio between a group’s population and the number of seats needed. This is a number would typically be 1.0 for traditional workspace and greater than 1 for agile workspace. For example, an accounting group might require complete assigned seating and would have a mobility ratio of 1.00. A field sales operation on the other hand might need only limited office seats and might have a mobility ratio between 1.5 and 2.0. Applying the ratio to the organizational side of the equation accommodates moving groups between locations since the seats aren’t changing, only the group using the seats.

Population – The number of people in a departmental group needing assigned or shared seating.

Effective Occupant Count – This measurement is calculated by dividing the total population of a departmental group by the group’s mobility ratio. For example, a field sales group of 100 people with a 4.0 mobility ratio would have an effective occupant count of 25. To satisfy their space requirements, we would therefore look for 25 seats.

Hoteling

Hoteling is the practice of providing a workspace that can be used for short periods of time. Many companies will utilize a booking system that allows occupants to reserve space for several hours or days. It is beneficial in ensuring that visitors, employees that usually work remotely and part-time employees are assured of adequate workspace without the expense of providing these individuals with full-time assigned workspace.

Hoteling can also be used for special workspaces such as focus rooms, allowing these spaces to be booked when needed.

Coworking

Coworking is a relatively recent phenomenon that has its roots in start-up business incubators. Coworking has some similarities to traditional “executive offices,” where conference rooms and a reception function are shared by independent professionals. However, coworking typically provides space that is open rather than enclosed and is not assigned. Coworking spaces typically operate with memberships where members contract for a specified number of hours of usage per month.

In the past five years, coworking spaces have opened in most major cities around the world. They have become popular with start-up companies whose future space needs are uncertain and with freelance creative professionals who benefit from interacting with other creative professionals.

Coworking has not yet seen significant use by larger companies, but the field is evolving rapidly and we could see corporations use coworking for remote offices.
The Use of IoT Sensors to Determine Real-Time Occupancy

As the nature of work changes and technology enables many people to work anywhere, anytime, many organizations are observing reduced use of traditional office space. When considering moving to a shared workspace approach, these companies have the need to more accurately understand how and when their office space is being used.

The Internet of Things (IoT) movement in technology has recently brought significant advances in sensors. The use of motion sensors can provide valuable data that can be used to understand occupancy on a real-time basis. For example, an organization might determine that their office space is on average used at 55% capacity, but with a peak capacity of 85% on Wednesday afternoons. This could provide support for a decision to reduce capacity by 15% and implement a shared workspace policy, knowing that the peak load could still be accommodated. Collecting actual utilization data is also very valuable in establishing mobility ratios needed to implement an agile workspace solution.

Indoor GPS is another technology that has interesting possibilities. Using high-definition access points, these systems are able to precisely track locations of smartphones and other devices emitting Wi-Fi or Bluetooth signals. Companies considering this technology should be aware that many employees will have privacy concerns with this technology, even if they are assured that data is anonymous.

Another technology with great potential is the use of stereoscopic cameras that can be mounted in doorways to count people coming into and going out of a space. When used with conference rooms, this technology can provide valuable data about meeting room utilization, supporting decisions to “right-size” meeting rooms.

Other technologies that have interesting potential include RFID systems used with employee security badges, sensors installed in light fixtures, and sensors called beacons that can sense low-power Bluetooth signals. Collectively, these technologies bring exciting new possibilities of improving our understanding of how buildings are used and making buildings responsive to their occupants.
Appendix 1: Using BOMA and IFMA Standards for CAD Polylines and BIM Area Boundaries

1. Draw the Exterior Gross Boundary to the outside face of the exterior wall.

2. Draw the Interior Gross Boundary based on standard used
   - If IFMA standards are being used, draw the Interior Gross Boundary to the inside face of the wall.
   - If BOMA standards are being used, draw the Interior Gross Boundary to the “dominant portion” of the inside face of the exterior wall. The dominant portion rule states that the measurement should be made to face glass or solid wall, whichever makes up more than 50% of the wall measured vertically. In other words, if a portion of wall had a 9’ ceiling and a window starting at 3’ going to 8’, the glass would be 5/9 of the wall.

3. Draw polylines (AutoCAD) or area boundaries (Revit) for vertical penetrations and their enclosing walls. Vertical penetrations include stairs, elevators and mechanical shafts. Polylines or area boundaries include enclosing walls when abutting any other type of space. When abutting another vertical penetration, draw to the centerline.

4. Draw polylines or area boundaries for all core spaces including restrooms, electrical closets, custodial closets and primary circulation. When abutting other core spaces, draw to the centerline. When abutting tenant spaces, include the wall.

5. Draw polylines or area boundaries for all offices, open-plan workstations and other rooms within tenant space. Draw to the centerline of all interior walls.
About the Author

Michael Schley is the Chairman and Founder of FM:Systems. He founded FM:Systems in 1984 with the vision of creating a flexible, comprehensive facility management system that could be easily used by facility planners and managers. He chairs FM:Systems' Board of Directors and is engaged in guiding company strategy and product direction.

Mr. Schley is recognized globally for his expertise in facility management technology and has spoken at numerous conferences throughout the world. He organized the first Workplace Strategy Summit conference held at Cornell University in 2012. He was recognized by the International Facility Management Association as an IFMA Fellow and serves as Chair of the IFMA Foundation.

About FM:Systems

Founded in 1984 to help facilities teams effectively manage even the most demanding building portfolios, FM:Systems created FM:Interact, a Cloud-based Integrated Workplace Management System (IWMS) which can help to improve the management of space, occupancy, assets, moves, maintenance, leases and property.

FM:Systems’ promise is to provide their clients with quick and easy access to key facility information such as floor plans, reports, employee information and critical documents which can enable facilities teams to securely share information and manage facility processes more effectively that impact the entire organization.

For further information, visit fmsystems.com
Best Practices for Space Management
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