

Change Is Good: The facility planning implications of movable modular casework systems

Over the past 25 years, movable modular casework systems have helped healthcare facilities around the world deliver better care and adapt to change. As change occurs, on the micro and the macro levels, a movable modular casework system reduces downtime and provides the ability to reuse components.

These benefits, and others, don't automatically accrue, however. Selecting the appropriate system is as critical as dealing with planning issues to ensure that the healthcare facility gets the most out of its investment.

Defining modular casework

Webster defines *module* as: a standard or unit of measurement, a mathematical set that is a commutative group under addition and that is closed under multiplication.

Webster defines *modular* as: of, relating to, or based on a module, constructed with standardized units or dimensions for flexibility and variety in use.



In other words, a module is a standard of measurement with a mathematical relationship. That is, $2 + 2 = 4$. So, when a casework company calls its base cabinets modular, but offers them in 3-inch increments, it has really lost the original meaning of module. Modular, then, is constructed with standardized units or modules for future flexibility, not just for ease of initial planning.

That brings us to the definition of *flexibility*. To be flexible is to be capable of responding to changing situations. The idea is embodied in a system with a limited number of parts that work together to accommodate change.

For example, 24-inch-wide components can be combined to work with 48-inch-wide components. This is impossible to do with components based on 3-inch increments because there are too many possible combinations to work together in future changes. Movable modular casework is composed of a limited number of interchangeable components.

The second characteristic of moveable modular casework is that the work surface is independent of under-counter storage. That is, if you need a work surface, you don't need to support it with a base cabinet. The need for a work surface and the need for functional storage are two different decisions.

The third characteristic is that the storage units also integrate into the materials and logistics management (MLM) processes of the facility. For example, the drawers are interchangeable with the carts used to supply the units or the actual carts can be converted into exchange units.

Finally, the components in movable modular casework are easily cleaned, both individually and as configured work environments. These are the criteria that should be used in evaluating how successful a modular system will be in actual use.

Types of change

Change occurs on essentially two levels: micro and macro. Micro level changes include the little changes that go on every day in a healthcare facility, such as accommodating new supplies or supply distribution systems.

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There is the frequent change in data and telecommunications equipment: new monitors, nurse call and phone systems, intercom and security systems. There is new equipment, either for treatment or for testing. Often, duplicate systems are installed in order to test new software in actual clinical environments without compromising existing patient care. A typical clinical lab will have a 20 percent churn rate (rate of change) of equipment per year. The advent of leased equipment and the practice of manufacturers providing equipment as a part of a contract to provide the required reagents have accelerated this rate.



A typical clinical lab will have up to a 20% churn rate in equipment each year. Note foot stool to facilitate loading of analyzer creating an unsafe work environment.

Lastly, there is the need to accommodate staffing ergonomics. With multi-shift operations, it is important for both left-handed and right-handed people to have proper work environments for task-intensive work as occurs in areas such as cytology. Adjusting storage and work surface heights to prevent workmen's compensation issues and injuries is important.

Macro level change may require a design and construction process to resolve. These include things like a change in function for a space or facility. It may also include the expansion of a service or a new service being marketed.

Regulatory agencies have an impact on facility design. ADA and OSHA legislation must be considered. The Clinical Lab Improvement Act (CLIA) established new requirements for clinical labs that want to participate in federal reimbursement



With the proliferation of computerized equipment, proper ergonomics are difficult to accommodate. Note "keyboard drawer."

programs. The Joint Commission for the Accreditation of Healthcare Organizations (JCAHO) reviews healthcare facilities on a regular basis and reviews both procedures and facility layout to provide accreditation.

Program inaccuracies may also drive change. These may come about from a change in clinical staffing that can happen during a project, or it may result simply because it is difficult to predict the exact nature of future space or process needs in healthcare.



We ask clinicians to tell us exactly how they will need to work two to five years from now, and they are unable to do that any better than any of the rest of us. This results in a "padded" program.

Changes in program requirements such as storage needs may create unsafe environments when facility change is difficult.

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If you were to ask me what I need in the future and I really don't know, I will tell you that I need more than I have currently in order to cover myself. For example, knowing that I will have to live with whatever I end up with, I will ask for more space to provide some insurance.

A movable modular casework system can reduce downtime since many changes can be done by the end users themselves without the dollars, dust, and disruption of a construction project.

In addition, these systems allow reuse of all components and alleviate the need to dispose of conventional casework that is damaged, the wrong size, or the wrong color. And I can selectively replace modular components without having to replace or resurface an entire run of cabinets.

Criteria for selection

The first and most important criterion for selecting the right movable modular casework system is that it must support the functional requirements of the space. It must be strong enough to support the actual loads involved. It must be cleanable and withstand the cleaning agents used in healthcare settings. It should be user-friendly so end users can adjust the work environment themselves and not hurt themselves in the process.



Strength and mobility are essential requirements for movable modular casework systems.

It needs to incorporate the element of mobility since clinical work processes are not static and involve the movement of patients, staff, and supplies. And it must integrate with the materials management system in order to maximize the productivity of the staff in facilitating patient care.

The second criterion centers on how easy the system is to change. How much time does it take, what special tools are required, and how much skill is required to make changes to the system?

What changes can the staff do themselves? Can minor changes be done by "skidding" partially assembled units around? A good way to evaluate competing systems is to require a mock-up. Brochures all look good, but having your staff see the product assembled and changed is the best way to compare promises versus reality. Seeing a work surface change from sitting to standup height or drawer units moved from left- to right-hand configurations are important, real-life application requirements.

Since I want a system that responds to change over time, will it be available over time? What is the supplier's track record of maintaining compatibility? Does its new systems interchange with its older systems? How durable is the system? Will it stand up to repeated moves and adjustments over time? Are work surface edge details susceptible to damage? Anything I want to accommodate change must withstand being moved.

Lastly, can I afford it? What is the initial cost versus the lifecycle cost? Am I comparing "apples to oranges?" This can easily happen, since movable modular systems typically include electrical components, task lighting, work tools for form management and display products such as tack boards that are not included in conventional casework bids.

What is the warranty? Is it written? Is it appropriate to healthcare usage, which is 3 shifts per day, 7 days per week? (Some "lifetime" warranties are defined as 8 hours per day, 5 days per week! Typical casework warranties are for only one year, in accord with construction contracts.) Does the manufacturer offer a standard multi-year warranty or is the warranty only on a project-by-project basis?

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Planning issues

The first and most important planning discipline with movable modular casework systems is to choose a limited number of compatible sizes to plan with. By choosing a limited number, you will reduce the number of pieces to manage over time. By choosing compatible sizes (such as 24/48 inches or 30/60 inches) you will allow the user to maximize reuse and protect his investment.



Strength and mobility are essential requirements for movable modular casework systems.

Choosing sizes such as 36, 48, and 60 inches may make it easier to do the initial plan, but future changes will be very difficult. Two 3-foot modules don't equal a 5-foot module. These "modules" are not compatible with one another. A 4-foot unit won't fit into a 3-foot hole.

Since I am hanging components on the architectural wall, I am concerned about the strength of the wall. For the Herman Miller system, we want a minimum of one layer of 5/8-inch drywall on 20-gauge metal studs. The wall needs to be braced above the ceiling, in other words, it cannot stop at a lay-in ceiling but some studs need to extend to the structure above or the top of the wall needs to be braced with diagonal "kickers" to the structure.

Weaker walls may not fail by allowing products to pull off them, but they may flex sufficiently to make the work areas seem floppy and unstable. Our system is also designed and tested for a worst case scenario. While an initial installation may be supported adequately by a weaker wall, the end user may make changes later that impose greater loads and cause the wall to fail to perform.

There are also some dimensional issues to be aware of. Drywall construction is not typically entirely square or plumb. For example, an inside corner alcove may measure 8 feet clear, but a few inches away from the corner there may be less than 8 feet. That's why you should allow a little extra space or leave one side "open" when planning with modular systems.

In addition, floors are not typically level so the system should accommodate this with adjustable glides or other easily adjustable designs that provide level work environments across an uneven floor.



Adjustable plastic glides accommodate uneven floors without damaging the finished floor material.



Coordination with wall mounted electrical and mechanical equipment is necessary to avoid conflicts.

There are interface issues with other trades, especially the electricians and plumbers. Where there are wall mounted products, they must be coordinated with wall mounted electrical devices. Vertical wall strips should not be cut to allow for horizontal conduit because this drastically reduces the strength of the system.

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Power entry and data entry locations should be coordinated. The modular casework supplier may provide some electrical components, such as task lights. Sink locations and utility enclosures must be coordinated and their capacities communicated during the design phase so installation will go smoothly.

The sequence of construction is typically different for modular systems. Where conventional casework may go in before the finish floor and paint, modular casework will go in after these are done. This allows the flooring contractor and painting contractor to work unencumbered and eliminates having to cut or paint around cabinets.

The modular system may provide utility chases for use by other trades. Since many trades are out of the way when the modular systems are installed, there is less damage and fewer punch list items.

Even though custom sizes are available, it is a good idea to use standard vocabulary. This will make future changes easier and improve reuse. It will also be more cost effective in that standard products are typically less expensive per unit than customized units. In addition, the cost of future custom units may change drastically, depending on the quantities being ordered at any one time.

In choosing colors, the same issues hold true. Standard colors are more likely to match in the future than custom colors. It's also good to choose from the most limited color selections first. For example, while we offer hundreds of fabric choices, we offer only two base colors that go throughout our system: a neutral tan and a neutral gray.

These two neutrals are designed to have a long life, since the end user will be living with them for a long time. Accent colors can be added on architectural elements, such as walls and floors, which will be changed and refreshed over time. Some modular products such as tack boards or flipper doors can also be easily recovered in the field on an as-needed basis.

It pays to avoid custom fabrics, as well, since their future availability cannot be guaranteed. By choosing two or more fabric families that are compatible, you can provide a degree of insurance against future discontinuations.



Movable modular casework systems respond easily to the changes happening in healthcare facilities and are cost competitive with traditional, fixed solutions.

Movable modular casework provides many benefits: it responds to change, it is easily sanitizable, it will last and will be available over time, it is cost competitive, and it is designed specifically to support healthcare work environments. When designed and planned with these guidelines, the facility will achieve a maximum return on investment over its useful life and be better able to accommodate the uncertain demands of the future.

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