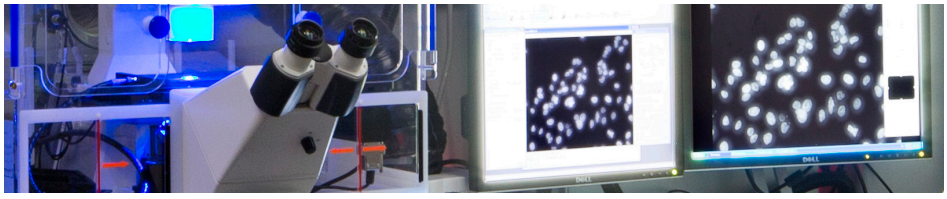
Life-cycle planning for laboratory equipment

Rachel Nelan, AIA, LEED AP BD+C
Lauri J. Kempfer, Lab Planner

In a world where the only constant is change, it is not enough to only plan where the equipment will be located. Planning must encompass the full life-cycle of the equipment; mapping out how the device will be purchased, installed, utilized, managed, and, ultimately, retired.

With laboratory equipment continually evolving, there is a real-world need to keep up with new technologies. Therefore, it is not surprising that many organizations are finding their available research space dwindling due to the ever-increasing variety of equipment within their laboratories. In order to optimize lab equipment, space, and personnel, many organizations seek a better understanding of equipment utilization so that they can balance equipment cost with efficiency and effectiveness in use.



A review of several real-world examples reveals that, often, the specific cause behind a planning issue is far more complex than simply needing more space for the equipment.

1

Purchasing Processes

Without established acquisition methodologies, equipment can quickly consume laboratory space. An evaluation for a higher education client revealed consumables and excess equipment were cluttering the labs. Analysis showed these problems stemmed from the manner in which resources were allocated.

As the funds used to purchase consumables and equipment came from individual rather than institutional budgets, researchers were constantly looking for ways to maximize the money spent on actual research and minimize the funds spent on materials and equipment. Normally, this would be viewed as a positive behavior; however, without the proper controls in place a variety of problems arose.

To receive discounts, consumables were purchased by individual researchers in bulk. Due to the lack of separate storage space, the materials were stored within the labs, occupying prime real estate. Also, to get the most for their money, secondhand equipment was purchased. Often this equipment was not in proper working order and was placed on the researchers' lists of items to fix when they had time. In other instances, researchers would purchase unneeded equipment because it was available at a good price, with the hope that it may be useful in the future.

It was not uncommon for this non-functioning or unneeded equipment to sit idle, occupying valuable lab space for extended periods of time.

Since the equipment was purchased from an individual researcher's budget, the researchers felt they owned their equipment. This fostered a reluctance to share equipment out of fear it might be damaged or mistreated. As a result, individual pieces of equipment were underutilized and duplicate equipment was acquired.

Although it may seem obvious to maximize a research budget, these behaviors resulted in vital lab space being used for material storage and storage of unusable and unneeded equipment. This problem could be solved through allocating a separate materials and equipment budget for the researcher or for the entire program, installing control procedures for how equipment is acquired, and implementing a program for sharing resources among labs.

2

Operations

The location of an individual piece of equipment can result in its underutilization. This was evident in the case of a client with a 600mHz NMR that supported a number of researchers. Simple to operate, the instrument was valuable to many of the staff on a daily basis, but not readily accessible.

Originally housed within one primary researcher's lab, other researchers were reluctant to intrude into this space and possibly disrupt the researcher's work. There was no system to reserve the equipment, so the only way to determine if the equipment was available was to physically check.

The solution involved relocating the instrument to a shared equipment room located on a main lab corridor frequented by the researchers who used the instrument the most.

A researcher was assigned as the primary point of contact for the NMR and was responsible for ensuring it was cleaned, operated properly, and its maintenance record updated. However, since the equipment was in a public space, the researcher was not seen as the owner of the equipment. To alleviate this, the point of contact can be rotated among the primary users.

A simple paper schedule on a clipboard was used to reserve time on the NMR. Another option would be a schedule as part of an equipment database accessible to everyone. This would allow researchers to view equipment assets and schedule them when needed.

In addition to relocating the NMR to a central location and establishing a process for reserving time on the equipment, the redesign resulted in a well lit and organized lab support room, with a fully glazed door that enabled passersby to easily recognize if the equipment was currently in use. The researchers reported that this open and shared location greatly improved their ability to access and utilize this valuable instrument effectively.

3

Storage

When attempting to effectively optimize space, storage of unused or infrequently used equipment needs to be carefully considered. Storage methods have some very real pitfalls, ranging from the timely retrieval of equipment, its condition upon return, the cost of storage, and the storage facility's proximity to researchers' labs.

One of the greatest challenges in creating a storage system is maintaining the staff's knowledge about off-site equipment. During a recent space utilization study, one researcher explained they kept large amounts of rarely used equipment on site to serve as a visual trigger of what was available.

The challenge of off-site inventory can be overcome by an image catalogue of the equipment that is available for use. Uploading equipment information and images into a centralized database allows for the researcher's triggers, while also accomplishing the goal of decluttering the lab.

A database can also serve to document equipment retrieval requests, timetable requirements, and other administrative requirements of a storage and retrieval process.

4

Decommissioning Processes

During a client analysis, we identified their excessive equipment was due to the decommissioning process. The client had a fairly straightforward method for acquiring equipment, requiring review and approval signatures from two people. However, the client's process for decommissioning and liquidating existing equipment was complex and time consuming, requiring seven different approval signatures.

Once a researcher initiated the decommissioning process for a piece of equipment, various trades and specialists needed to survey the equipment to disable utility connections, decontaminate the equipment, assess its viability for future use by other researchers or for academic functions, and create a plan for movers to relocate the equipment. Many of these review processes include multiple site visits before approval would be given. As the process was complex and time consuming, many researchers avoided dealing with the issue, accumulating numerous pieces of obsolete equipment.

This kind of organizational bottleneck can quickly become known as an obstacle throughout a research community, not only in hindering the removal of old equipment but in procuring and placing new equipment.

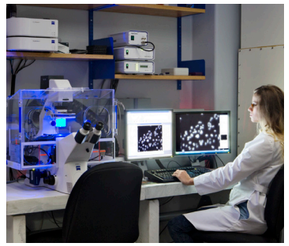
It is vital to identify these bottlenecks in the decommissioning process and establish corrective measures to ensure the process is efficient. Assigning a single point of contact who manages all trades and steps in decommissioning can streamline the process and build trust within the researcher community that their equipment needs are being served.

Solutions

5

Equipment planning requires more than a cataloging of each piece of equipment's size, utility requirements, and utilization statistics. To develop an effective strategy requires an understanding of the organization's operations, their purchasing and decommissioning processes, and the culture of the researchers themselves. It is clear that a balance needs to be struck between having too few controls in place and having too many.

An organization must consider a multitude of issues when planning how research equipment will interface with the research environment throughout its life.



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