BIOPROCESS ONLINE

White Paper

Understanding And Defining Laboratory Capacity In Biopharma

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Has anyone asked you, "What is your laboratory capacity?" In the scientific world of planning laboratories, defining capacity is not so straightforward. This makes answering the question challenging unless you have a method in place. The reality is, you have options for measuring your laboratory capacity.

It has been my experience that a strategic facility plan for a company's laboratory resources cannot be developed without a clear understanding of the existing resource's capacity. What is lab capacity? Well, that is the first step: Each company must determine how it will define capacity for its laboratories.

By contrast, in the world of offices, capacity is most often defined as the "number of workstations" or "number of offices" that a particular space or building can accommodate. This then translates to the number of people that this space can support, so it's pretty easy, for example, to identify that a specific building, with a specific office/cube configuration, has a certain headcount capacity. If that building is reconfigured, it may have a different capacity.

Understanding and Defining Laboratory Capacity

In the scientific world of laboratories, measuring capacity is not so straightforward. The number of assays, the number and types of equipment or the number of people who can reasonably work in a laboratory can determine its capacity. This is why it is so critical that the best method to measure capacity for your business is identified up front. The options for measuring laboratory capacity generally fall into three categories:

1. **Operations-Based:** These are the labs that are throughput oriented. Similar to a manufacturing process, the capacity of the operations-based lab can be measured by the number of tests, number of projects, number of runs or total working volume that can be produced in a given space. An example of a capacity statement for this type of lab would be, "The maximum capacity of X-Laboratory is 10 projects running simultaneously or 5,000 samples tested per day."

2. **Equipment-Based:** Equipment-based labs typically have one or two major types of equipment, and they have a lot it. In the analytical laboratory, this might be ahigh-pressure liquid chromatography (HPLC) or a mass-spectrometer. Modern analytical labs are specifically designed to accommodate the equipment being used. New advancements in the flexibility of casework design have allowed the analytical lab to increase its capacity as measured in pieces of equipment. An example of a capacity statement for this type of lab would be, "The maximum capacity of X-Laboratory is 14 HPLCs."

3. **Headcount-Based:** For many scientific companies, laboratories must be flexible in both their operations and in the equipment they house. These labs have one or two of everything in them and have to be more multipurpose in their use. This is the case for research-based labs. This is where "the number of people who can reasonably work in the space" best defines capacity. Capacity for this type of lab should be based on a careful examination of the amount of bench space that each researcher or scientist needs to do his or her work. An example of a capacity statement for this type of lab would be, "The maximum capacity of X-Laboratory is 10 people." If an organization works more than one shift, the headcount capacity can either be expressed as the total headcount that can be accommodated in all shifts or the total number of people who can work in the lab at one time. While there is no "right" answer to this, I prefer to define a lab's headcount capacity as the number of people who can work in a lab at one time. The addition of shifts increases production or throughput, but it does not change the lab's capacity.

Process for Determining Laboratory Capacity

Seek the advice of the scientific department heads and director to establish the best definition of capacity for their group. After all, the definition needs to work for them and be relevant to how they conduct business in that space. However you choose to define capacity, it should be clearly identified, and the definition and any key assumptions need to be documented for future reference. Once the appropriate definition(s) of capacity is chosen for your laboratory, information can be gathered to establish the capacity figures.

It has been our experience that this process also needs to involve the users at some level. While the level of user involvement varies with the project and the lab type, it is critical that lab activities and equipment are understood well enough so that projections of available additional capacity do not compromise the scientific activities occurring in the space.

Taking time for a detailed understanding of lab processes will help with determining capacity and can ultimately impact the company's bottom line. Typically, we find lab equipment and processes that can be shared with other groups, and very often we've uncovered certain aspects of the lab's operations that may be affecting the efficiency of the lab. Identifying these aspects early can help save on future costs and help redefine the most efficient lab capacity for planning purposes.

Capacity Still Needs to be Translated into Headcount

Whether you have determined that your laboratory capacity is 10 projects, 5,000 samples or 14 HPLCs, you will still need to translate capacity into headcount. While department directors need to understand the number of projects that they can add to their department, CEOs and CFOs will translate those project milestones into the total number of new-hire employees a department is allowed. As a strategic planner, you need to understand the capacity of your facility from both angles, so if your lab can accommodate 10 new projects, you need to understand how many people are typically needed to run a project. Keep in mind that if you add 10 new projects to your laboratory and each project requires four people to run it, your office building must also have capacity for 40 new-hire employees!

It is the role of the strategic facility planner to answer the following questions: "What is the current capacity of your existing labs?" "How can we increase the capacity of your labs?" "When do you need to trigger another facility?" This is the type of high-level strategic facility planning information valued by corporate executives as they plan the future of their companies.

Debora Hankinson has more than 20 years of professional experience encompassing strategic facility planning, laboratory planning, programming, project management, and design. Debora's expertise lies in the strategic planning of complex life science projects. She has been responsible for planning numerous projects for several fortune 500 companies including Amgen, Genentech and Novartis. Debora has also worked with medical device companies, universities, and public agencies. Debora uses her highly focused expertise to develop strategic, intelligent solutions for companies in the science and technology fields. Her expertise in strategic planning helps companies to grow efficiently and keep their competitive edge.