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# Hardware considerations for operation in an animal facility

Halogenics Technote #7

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13/05/2010

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## So what do we need?

If you're looking at running a database management system such as Genotrack for your animal facility, there are a number of things you need to think about.

You and your team have probably spend many months evaluating the various solutions before settling on a system, and now you've made that decision you need to look at how you're going to implement it.

How will it work? How many computers do you need? Desktop or Laptop? Fixed or Mobile? Where do you put them? What other hardware do you need?

These are difficult questions and there's no single right answer - many of the available options will work, some may work better than others. To a large extent it depends on your (proposed) workflows.

Let's look at a few of the things you should think about before you get too much further down the track.

## Positioning

So what goes where?

Again, this partly depends on your workflow. It depends on the size of your facility, the number of staff, and the amount of data you need to process. You might be able to survive with a couple of strategically placed computers which are shared between rooms or staff. Ideally, the data should be entered as the task or batch of tasks is performed, so that as much as possible, the state of the system matches the state of the room/facility.

However, you should try to avoid a two-step collection and data entry process. If information can be entered directly into the system, it's a good thing. It's more up to date, and the fewer times you enter or copy the data, the less opportunities there are to make a simple mistake in transcription.

Having a computer in each room works well, though if you plan to make use of the barcoding functionality you may need to look a either a long cord, wireless reader or a laptop which can be moved to within "range" of the racks/barcodes. This will obviously also depend on the position of the

computer, and the size of the room itself. A well placed central computer may be able to reach all racks depending on the layout.

Along these lines, some sites of discussed the possibility of a "laptop on a trolley" type arrangement. This may be a good idea, but it also introduces a couple of new issues:

- If the computer is moving, is it connected to power? What about network?
  - If it's connected to power, are the trailing cables an OH&S issue?
  - If it's not connected to power, will battery life be an issue?
- Is the trolley moving between rooms? If so, are there potential cross-contamination issues with moving the hardware?

Other sites are looking at waterproof keyboards inside hoods to maintain sterile field while entering data.

An external mouse is probably worth the additional space it requires - touch pads with gloves may or may not work too well depending on the device.

As we mentioned earlier there isn't necessarily a correct answer - what is best for you will depend on your workflow, your facility and your requirements.

## Real Estate

Space is obviously a factor - if you go the desktop approach, you may wish to consider the "Mac Mini" or "iMac" type CPU form factor. These are PC equivalents to these available, and they may be worth looking at as they can take less desktop real-estate.

For the Mac mini style, the "computer part" can be hidden under a desk, on a shelf or at the back of a desk or bench<sup>1</sup> - you only need find space for the display (which could be a wall or arm mounted LCD) and the keyboard/mouse.

With the iMac style, the "computer part" is integrated into the display, so there's one less box to find a home for.

## Networking

Many facilities are/were not built with computers in the animal rooms in mind, so network points could be an issue. If you're PC 2 or greater in some rooms, laying network points may not be possible/practical until the rooms come up for renewal. In this case, or if you're going laptops then you'll need reliable wireless networking in the rooms. As animal rooms tend to be buried in the basement of many facilities, there's often a lot of concrete and/or steel around, which can make this more challenging than you may think. This is something you should get your IT network guru to look at as soon as possible - you won't be able to use the computers without a network.

## Cleanliness

Dust is also a consideration - at my former place of employment we had iMacs in the animal rooms. Apart from looking really cool<sup>2</sup>, they had the added bonus of being convection cooled. No fan means less dust being sucked into the computer. The dust may cause overheating, which in turn can shorten the lifespan of the computer.

Keyboards are also prone to clogging, and there are sealed or waterproof versions available. This may be of interest if you decide to go the "data entry in the hood" route. Given you can get a pretty decent keyboard for under \$30, there's the option of treating them as disposable. ie: Be prepared to go through

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<sup>1</sup>Just make sure there's sufficient ventilation - a computer can cook itself without proper airflow.

<sup>2</sup>Just ask any Apple fanatic

a couple of \$30 keyboards in 18 months rather than paying a lot more for "ruggedized" options. That said, I saw a roll-up soft keyboard (which was presumably waterproof) in a shop the other day for about \$40, so they might be cheaper than they used to be.

## Repairs

You should also consider the logistics of repairs and maintenance.

1. How do you get the computers clean/behind the barrier?
2. How do you get them decontaminated if/when they come out for repair?
3. How do you deal with tech support? Do you send the IT guys back there? What about parts and tools? (see point 1)
4. Are there issues with disposal when they're taken out of service?

Just something to think about for the longer term.

## Vendor Specifics

Getting back to specifics, look seriously at the minimum hardware specifications<sup>3</sup> from your vendor.

In terms of RAM and CPU speed, more is almost always better.

RAM is cheap, and can be cheaper to upgrade at purchase than independently. Look carefully at the options for upgrading a CPU - the bigger/better/stronger/faster the computer is now, the longer it will probably be usable down the track. This might make the relatively small additional cost worthwhile. It's impossible to predict how long a computer will be usable, as new technologies, plus constant improvements in processing power and speed can render what seems great today obsolete tomorrow. That said, as a general rule of thumb, if it's faster now, it should be less slow later than a model which is slower now.

Another thing to watch out for is resolution - many "netbooks" or smaller "compact" laptops do not support the minimum resolution required by many of the forms. The effective difference in actual size between the compact laptops and the regular laptops is often minimal, but the screen resolution supported can vary quite a bit.

I would **STRONGLY** recommend getting something which supports at least the minimum resolution listed. In our case the 1280x1024 restriction actually comes from the specs of the underlying platform, but we've taken that into consideration when designing our forms - particularly the larger forms. In some cases (strains, animals, matings, litters) the forms will probably contain a lot of information - even with tabs for multiple "pages".

Form design is a trade off between showing you all the information you want "at a glance" on the one screen, and fitting it on the page in a usable manner. This is not as easy as it sounds, and having to scroll within a form will only make the system less enjoyable for you.

If you're going for LCD displays, be aware that some of the widescreen options may be less than the required 1024 vertical - take this into consideration when shopping. Unless you're putting displays under a shelf, an extra inch on the vertical may not be a big deal from a space point of view, but might make a big difference in terms of available screen real estate.

## Summary

As mentioned earlier, there really isn't a single correct solution - every facility is different, has different workflows and staff prefer to work in different ways. This can be due to regional legislative

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<sup>3</sup>Genotrack minimum requirements are on the Halogenics website at: <http://www.halogenics.com/support/index.html>

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requirements, the species or types of animals you're working with, or simply the way a researcher, supervisor or technician likes things done. On the software side, our job is to give you a flexible solution which can adapt to these various requirements and workflows. The hardware needs to support the solution you select, but it also must fit in with the specific requirements of your facility.

While we haven't given you "the answer" we've hopefully raised a few issues that you can think about as you go through the process of rolling out your colony management system.

If you have any questions, we'd encourage you to contact us at <[support@halogenics.com](mailto:support@halogenics.com)> - we're always happy to discuss any issues or thoughts you may have, and are more than happy to help if we can.