

## How to Promote a Facility in Order to Increase Use, Acquire New Equipment and, as a Result, Increase Revenue

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**D. Sherman:** Promoting and maintaining a facility is a major concern to many of us. I had the pleasure last spring of participating in the 2nd International Cryo-workshop held in the Bio-Imaging Facility at the University of British Columbia. I talked to the facility director, Elaine Humphrey, and saw what she has done in a relatively short number of years in building that facility. I was incredibly impressed so I asked Elaine if she would address this topic.

Elaine started out as a marine biologist in England and came across a problem that required electron microscopy. The first facility she went to was very discouraging saying that it was an extremely difficult technique. She managed to find another facility that made it easy. Consequently she got so turned on by microscopy that when she and her husband moved to Vancouver, she looked to work in this area at UBC. Before she knew it, she was facility manager of one of the core microscopy facilities at that university. I will now turn this over to Elaine so she can tell you what this facility was like when she started and how it got to where it is today.

**Elaine Humphrey:** I took charge of the EM Facility in 1996. My former boss took off for distant places and, as there were budget cuts at the facility, I had no assistants. So I got an undergraduate who wanted to work for a little money and some experience in the lab. She came in for 10 hours a week. That was my assistance in the first year. The equipment was aging. It was all film, no digital except for the confocal microscope. None of the light microscopes had infinity corrected lenses. The revenue was pretty good though. We had about 500 users, primarily from the Faculty of Medicine and the Faculty of Science. Quite a few users were regulars, especially for the confocal. I had to figure out how to cope and I knew nothing about confocal microscopy. I did not even know how to switch it on! There was one very experienced graduate student who knew all about the confocal, and I knew the computer end and all about NIH image and Photoshop, so we survived. Most researchers really only want to know how to collect their images and leave, and we put together a 1.5 day workshop for 6 people that did just that. They came in, got an introduction and then we took them to coffee so we could network and find out about their research projects. After giving them a demo of the confocal, we split them into two groups: half got hands-on experience and half got computer experience—what to do with the images is as important as collecting them. The final half-day session is one-on-one on the microscope with their specimens. I charged \$150 Canadian for the workshop because I had to pay for my graduate student. The workshops soon became so successful that the waiting lists were getting longer and longer.

All I was getting at this time was my wages and everything else had to come out of user fees. We had "inside users" who came from seven departments who put in \$2500/year into the facility. We were charging these inside-users \$11/hr for the EMs and the confocal. We knew we had more potential users out there and we had to reach out and get them in. "Outside users," those not in the "inside" seven departments, paid 2.5 times the inside user price, or \$33/hr, which is still not bad. We also have off-campus commercial users who pay still higher fees. Pretty soon users had to wait 5-6 weeks to get on the confocal microscope.

Five or six years ago, the Canadian government had a surplus of money amounting to about six hundred million dollars. It wasn't al-

located to anything and they decided that, since there were so many universities with aging equipment, that they should put the money into research. Of course everyone put in applications and the competition was pretty strong. The first year I put in an application that was quite different from the grants I had written previously and I failed miserably. I really needed a FESEM so I looked at the applications that won and I figured out what I had to do differently. I learned that I had to choose the right faculty to justify the equipment. We put in for \$3.3million and they gave us \$2.25 million.

I have a user's committee, and in the first three years we met twice: once to introduce me and the next year to see that I was getting on okay. I was pretty autonomous, so I would think of an idea and just do it. I decided that I had to write a grant for a new confocal microscope since I was the one that wanted it. The faculty wanted it too, but they didn't have time to write a grant. I had a faculty with good CVs and, if you want good instruments in your facility, you can't wait for faculty to say, "I want this." You have to say, "How am I going to get it?" I learned how to write a grant: I learned to say, "I want your CV and this is why you want this instrument." So you have to know what the instruments can do, which has been my reason for coming to MSA meetings.

Initially, the EM user's committee wanted a five-year strategic plan. The first step in creating a plan is to set goals. Our goals were that: we wanted more equipment, we wanted to train lots of people, and we wanted lots of usage. We put together a mission statement that mirrored these goals. I wanted the EM user's committee to oversee and look for grant opportunities, etc. But they were all so busy that I didn't get a lot of help from them at that time. So I needed to plan, prioritize equipment purchases, figure out how to manage the entire operation without any money for staff, all on my own. I also had to figure out what my role was going to be and develop that with my user's committee.

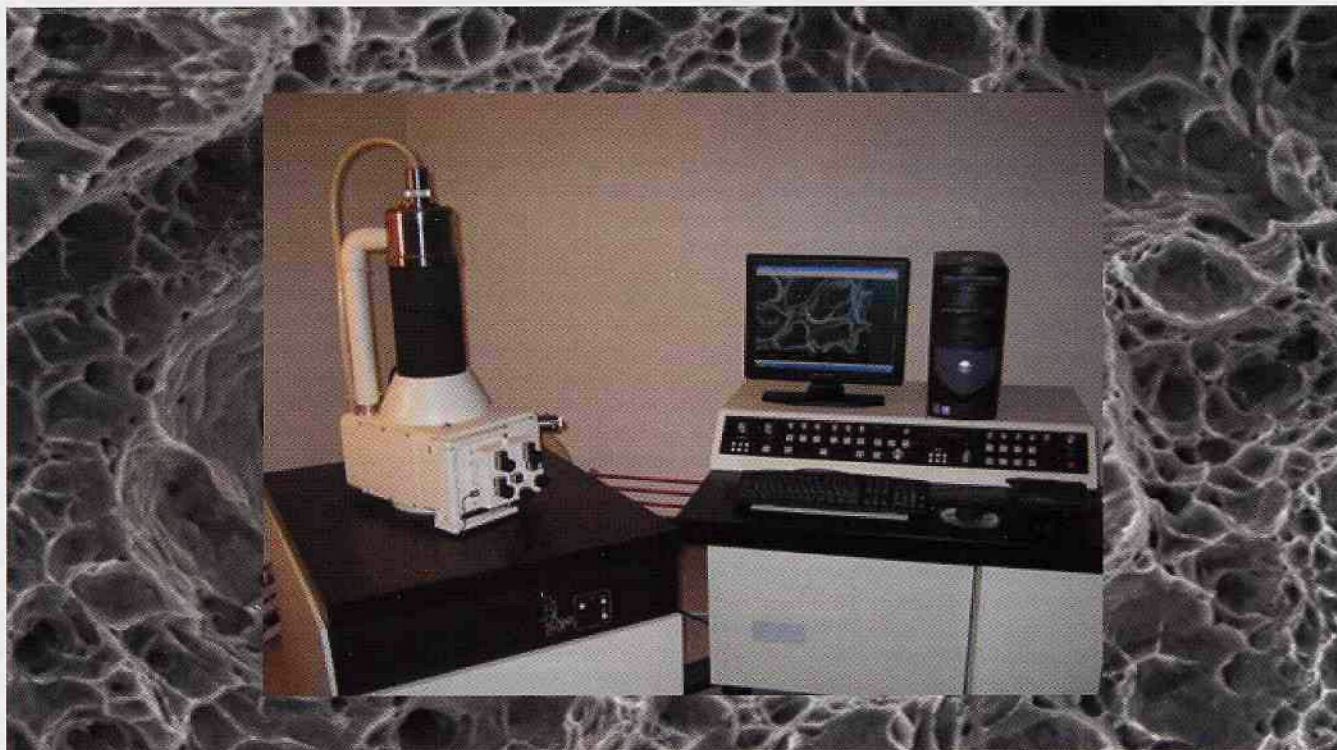
When you put a strategic plan together you put in long-term goals, and action items. Most of it requires networking. You network with all your departments and make sure they know where you are. I put together a pamphlet and PowerPoint presentation and would go to faculty meetings and convince them that they needed to take advantage of the facility. Next, you have midterm goals and action plans for the midterm goals. There are also the short-term goals. I managed to find a professionally done strategic plan for a volunteer group to use as an example. Most of this was how to get more equipment and develop annual fiscal requirements and other resource needs. It is also important to have a business plan. This is a work in progress at our facility and after it is completed we expect to be on a fully professional level.

We had a really long equipment wish list! There is nothing that makes acquiring new equipment easier than demonstrating meaningful results on problems that are important to the user community. For example we needed a new light microscope. It all started when I bought a \$12,000 digital camera to put on our existing microscope. The sales person came in to install the camera and said that he couldn't put it on that old microscope so he loaned me a \$60,000 microscope for a few months. When he came to get it back everyone was very upset. We were able to find a donor to give us some funds and we managed to get matching funds from the University to buy the new instrument.

It's also a fact that as soon as you get a good instrument and train people to use it, suddenly you have a lot more users. Eventually the instrument gets fully booked and users decide to buy one for their own lab. I thought that I would lose users by this means but, on the other hand, it is unrealistic to expect that the whole lab would be able to get time on one solitary instrument in our facility. It's better to act as the institution "center of expertise" and to work proactively to engineer and direct the growth of microscopy throughout the facility. So as the demand for microscopy in the whole institution increases, instruments multiply, and the entire community is more aware of our services. Also,



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when the users went out to purchase their own equipment, the researchers bought what they were comfortable with, so it ended up that the company that sold us our instrument got a lot more business. I further cemented our relationship with the vendors by identifying for them the departments and users that could benefit from their products. All of this self-serving networking has the additional benefit that external commercial companies learn about your operation via word-of-mouth. Then, when they find they need something, they know that you exist and evolve into profitable outside users.

When you are a one-person operation, you cannot do a lot of equipment service. You have to train the users to use the equipment. But, if you train the people to use the equipment and then they bring in others and show them how to use the equipment, you can get down time. Downtime in a facility, as you all know, is BAD. No revenue coming in, etc. The workshops turned out to be the best avenue to assess the competence of potential users, because in that half day when you are one-to-one, you get to see whether or not they know what they are doing and whether or not you can leave them on their own. If you are not comfortable with what they want to do, then they do not get the password for signing up on the computer. We originally had paper sign-up but now we have an excellent program called Calcium from Brown Bear out of Alaska (<http://www.brownbears.com>).

Starting in 1996 with one full-time staff, we now have grown to three full-time staff, two undergrad assistants, and a half-time office person. We brought in a whole ton of equipment, especially cryo equipment and microwaves. The number of users has increased and our revenue and usage time has doubled. I have a lot of users who don't have much money and I wanted to keep the prices down so the cost didn't put them off. When the new instruments came in, we increased our prices to \$25/hour from \$15/hour for our new TEM and SEM with fees for other services scaled appropriately. Outside users pay more. But the switch to digital imaging saves on film costs so the net is the same or better than what they were paying before. Our operation is cost effective and our use has gone up.

A website is one of the best ways to show off your facility. I was able to find students in a multi-media training course who wanted to put together a website. I then had to find someone to help keep it up-to-date and change it. We put a virtual tour of the lab on our website. Check it out at <http://www.emlab.ubc.ca>. Creating a movie-like tour similar to the one on our website is easy to do with a digital camera, and a tripod with a Kaidan tripod head, that lets you take a 360 degree panorama of images that are stitched together in Quick Time VR.

Let's stop here and open the floor for questions.

**Q:** Do you have an easy way to get feedback on publications made using your facility?

**Elaine:** Yes. The way our billing system works is that we have log-books everywhere. Everyone signs up when they use an instrument or supplies. We use Filemaker for billing and we bill every three months. On the bill is a line that says the bean counters want us to show how well we are doing. If you have had a paper published, given a poster, or had a thesis utilizing us, please give us the abstract or reference.

**Q:** Can you give us some idea of the revenue split between the different types of microscopy?

**Elaine:** If you go to my website and look at the calendar, you will see that the multi-photon confocal and the Radiance confocal are the most used instruments I have. There is often a six-week waiting list. I have people signing up in advance in order to get on those instruments. They then find out that their cells didn't grow and cancel, leaving an unused time slot. I do have a list of people that want to take that space but they may not be able to on very short notice. Thus, we have no one on the instrument and that annoys me and the other users as well. I could use your help solving that problem.

**C:** There are calendar programs that will automatically E-mail anyone who leaves their E-mail when there is a cancellation. I believe it is open source software so it costs nothing.

**C:** I wanted to ask you more about giving seminars to departments to encourage users. I tried that at the beginning but I didn't get the response I expected. So I found examples of research from specific areas that were relevant to the department and then the response was overwhelming.

**C:** I have gotten some faculty members to bring their classes over to see what the facility is like. Some departments have survey courses with incoming graduate students so they have an idea of where to go and what is available to them. Others bring graduate level classes over to see the facility. I tailor the discussion and images that they see to the discipline. I have even had art students come over and I showed them how you can combine science and art in this area. The students and instructors go back and talk to colleagues, which is very helpful in spreading the work.

**Q:** Do you have service contracts on your instruments?

**Elaine:** I have service contracts on all my major equipment. When you are a single person running a facility, as I was my first year, there is no way you can get along without service contracts. When you have aging equipment you have downtime, which means you lose revenue. So we had trouble making sufficient money to cover contracts. But you have to balance how much you can charge without getting too expensive. It becomes self-limiting if you increase fees too much.

**C:** Last year we had national service managers from 3 of the microscope companies talk to us about their service organizations. You will find that if you are really stretched, there are alternatives to full service contracts. If you want to take the chance, you may be able to get reduced service for reduced money. So that can help to keep an instrument under some kind of a contract rather than dropping it entirely.

**Elaine:** That is the biggest thing when I go to buy an instrument. What is the service like? Do I have to wait a week or is there service engineers close by.

**Q:** In the U.S. if you buy a piece of equipment on a federal grant and then you take in outside work from companies, you run into some very interesting regulations. There have been lengthy discussions about this on the microscopy listserver. Are there similar regulations in Canada when working with companies verses research universities if the government essentially buys the equipment through grants?

**Elaine:** No, the Canadian government encourages commercial collaborations. The CFI grants are allocated to increase research for the benefit of Canada. They want to see companies being set up that will utilize the Canadian research universities.

**Q:** Do you allow users to use the equipment after-hours?

**Elaine:** This is a good topic. I used to be very lax. This often led to spending hours trouble shooting non-functioning equipment afterwards. However, we had a break-in. The person who came in must have just had a backpack because he or she only took hard drives and 6 gigabytes of data. One of those gigabytes was mine. So what we did was to install a keypad system and a very high-security lock. I do not give door keys away to people. I do have some floating keys for working after-hours. First of all, I have to know that the after-hours user knows what they are doing and that they cannot get their work done during the week. I also give them the "Responsibility Lecture" before giving them a key. I do not let anyone come in after hours if they are a new person. I have to be comfortable that they know what to do. If they come in after hours they must have a number to turn off the security. They leave the key behind when they finish. We often let people stay after 5 o'clock since they do not need a number to get in. They just have to alarm the system before they go. If I do let someone come in and then



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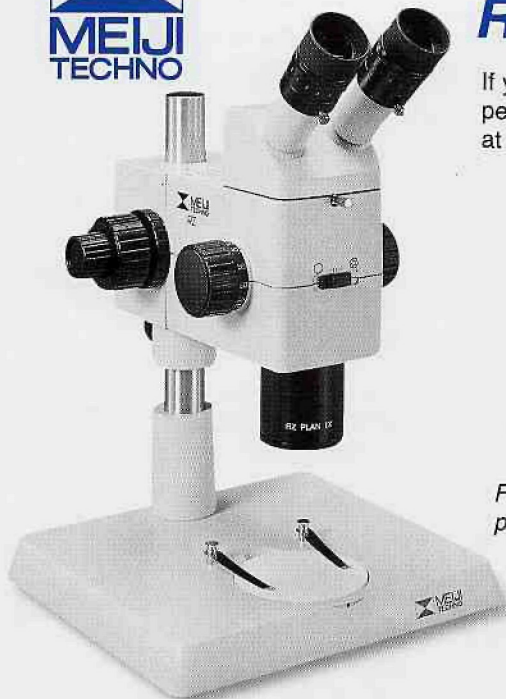
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find out he or she let someone else in without my knowledge, they lose the privilege. It works out pretty well.

**C:** We actually make very good use of after-hour users. We give the after-hour users a special rate, the off-peak rate, and people pay for bulk time. They can use grant money to buy bulk time for after hours and save money and it works well for us. Also people pay a deposit with us for the keys.

**Elaine:** What if they bring someone else in who is not a qualified user?

**C:** Well, the person who is the qualified user is responsible.

**C:** We have done something very similar to what Elaine has done. I have keys on large Plexiglas paddles so there is absolutely no way they can be lost or easily misplaced. As long as they have gone through training, people can sign keys out. We do have a very firm rule that users do not train users. That is absolute. Anyone who needs to be trained on a piece of equipment comes to us to be trained. They can work after hours once they are trained and have gained some experience when we are there. But I will say, quite frankly, that in many, many cases, the quality of the research that is done after-hours is not nearly as good as the quality of research done during normal manned hours. The simple reason is that, if they run into a little glitch, rather than running out and asking for assistance, there is no body to ask. So they just go along and don't get the advice that they need.

**C:** Once you have very experienced users who know what they are doing then your quality is maintained. But my experience shows that in many cases problems occur and are just glossed over in order to continue getting the data.

**Elaine:** In our case, with the confocals, sometimes the only way they are going to get time on the instrument is if they work after-hours. And as a Ph.D. student you recognize that it's quiet after-hours, and it can be the most productive part of the day. I didn't want to totally limit people from working after-hours, but I did want to be sure that my microscope was ready for a new user the next day.

**Q:** One problem that I had with the after-hours use was that I was on call, essentially 24/7. Did you have that same experience?

**C:** I am off-duty after-hours and I am off-duty on weekends. I may be in the lab but I am off-duty. If I am in the lab after-hours or on weekends it is for a specific purpose and that is my uninterrupted research time.

**Q:** Do you have any discount policy for the PIs who help you write the grants for the equipment?

**Elaine:** No. We have 3 rates: inside user rates, outside user rates, and commercial rates. Inside users are departments who now put in \$4000/year Canadian. If only one lab in a department is using the facility, then it may not be worth their while to put in the money to get the inside rates. However, as the number of labs using the facility from that department grow, then it becomes cost effective. I keep an eye on them over the course of the year and may suggest when, based on use, it becomes effective to be an inside user.

**Q:** What is your cost basis as far as cost recovery is concerned? Are you 100% cost recovery? I have to cover 50% of all costs.

**Elaine:** We are 100% cost recovery except for my wages. I now have a grant that helps pay for salaries and service contacts. I have had some support from indirect funds. The university decides where indirect funds are going on a year-by-year basis.

**Q:** I was just curious if you are strictly fee-for-service, do you request or require people to include you as co-author on papers and publications that come out of your facility? The reason I ask that is that one major pharmaceutical company sent us their work when they learned that we are strictly fee-for-service and do not expect to be included in any publications.

**C:** It is an interesting concept at our place. They don't allow collaborations with a core facility. The word collaboration cannot be used. It has something to do with the definition of indirect costs but I don't pretend to know how it is related. That doesn't mean that you can't write a paper yourself. Essentially we are fee-for-service and that is pretty much it. We do try to get an acknowledgement in the papers.

**Elaine:** It is amazing how you can get around things though. I have the same situation. We don't insist on having our name on a paper. However, I don't mind saying to people that I don't insist on it but I am looking for collaborations. And there were some people who liked that idea.

I wanted to run a graduate course. We didn't run courses for students but did everything one-to-one or as short workshops. Some of the graduate students really wanted credit for some of the things they were doing in the lab. So we put together a one semester graduate course called, "Introduction to Microscopy". I didn't have any money from the graduate school to put this course on so I decided that I would charge \$500 per student. I sent out an E-mail to all my departments and got an E-mail back from an administrator telling me, "You can't charge a graduate student for a course that they were taking for credit. That's against the rules. However, we want you to run this course." So we discussed it and thought that we could charge the supervisors. But their money is for research. So we ended up having the students bring in their own specimens and they end up with a portfolio of images taken of their specimen on the different microscopes. Since it was their research it was okay to charge to grants and it worked out fine. Now they are planning to formalize the courses so we will get funding.

I am not considered to be faculty. The Director of the Bioimaging Facility is a managerial/professional position, which means that I am only allowed to teach 3 credits a year. This actually works out in my favor. So we split the course and teach light microscopy one year and electron microscopy the next.

**D. Sherman:** Teaching through core facilities is a whole other topic. Maybe that is something we can consider for next year. Thank you, Elaine.

### Summary

1. Write a five year Strategic Plan with Long Term, Mid Term, and Short Term Goals
2. Obtain up-to-date instruments with digital capture. Learn to write winning grants. Have an equipment wish list ready.
3. Find the faculty with the best CV's with research programs that would benefit from the new instruments for the grant applications
4. Keep up-to-date with the latest techniques (go to MSA meetings!), be aware of old techniques
5. Communicate: Network with local departments, groups. Go to lectures, mix with faculty outside the facility. Get known: Pamphlets and brochures, Display materials in hallways (gives faculty ideas for projects), Reference information package for use in the library, departmental offices, etc; Internet; Media - TV, radio, newspaper, magazines; Guest speaker engagements; Workshops; Courses; Meetings; Publish
6. Keep a record of all users publications/posters/theses produced with the assistance of your facility
7. Have an excellent sense of humor.
8. Organize for Success: ongoing financing; ongoing leadership; administrative management; clear and consistent protocol and policy; an overall strategic plan and yearly action plans; regular information exchange; display and presentation of support resources; interest and support from other educational/research groups; a steady stream of projects that demonstrate the value of the facility. ■



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