



# Does your rate structure really matter? A precautionary tale

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# Wisconsin Centers for Nanoscale Technology



- Over 150 instruments
- Over 50 techniques
- 12 expert staff with decades of experience
- Support over 150 research groups and 600 users in biological and physical sciences across campus and regionally

- Located in the UW-Madison College of Engineering
- Shared instrumentation centers providing instrumentation, facilities, and expertise in:
  - Micro-electronics
  - Nanofabrication technology
  - Electron microscopy
  - Microanalysis
  - Soft materials characterization
- Gives students, faculty and industrial users access to state-of-the-art education and research centers
- Website <https://wcnt.wisc.edu>

Nanoscale  
Fabrication Center

Nanoscale Imaging  
and Analysis Center

Soft Materials  
Characterization Lab

<https://wcnt.wisc.edu>

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# Lab management software

- All Cores should have some automated form of gathering usage data - anything is better than nothing at all
- Many software platforms are available (FOM, iLabs, Lockbox, Idea Elan, BookItLab, Badger, custom built systems)
- Lab management software allows
  - User information tracking
  - User equipment privileges/access control
  - Usage tracking
  - Instrument status and downtime tracking
  - Communication with user base
  - Ease writing reports for management
  - Ability to make data driven decisions for acquiring new instruments, decommissioning old instruments, etc.
  - The critical ability to know exactly what is going on in your center
  - Documents archive for users
  - Billing functionality



# The dataset

- 12.5 years of data (1/1/2007 to 7/1/2019)
- ~520,000 sessions
- ~2300 Users
- ~500 PIs
- >2000 Grants
- ~860,000 hours
- ~\$14,000,000 in recharge



# Cap Definitions

- No Cap – rate remains the same regardless of usage
- Hard cap – when use/\$ reaches a certain level the rate drops to zero
- Soft cap – when use/\$ reaches a certain level the rate drops to a lower rate (i. e. 20%)
- Notch cap – rate stays at one level until certain use, then reduces and above a 2<sup>nd</sup> level it goes back to initial rate. No cap/Soft cap/No Cap
- The caps can be done by PI/User or a combination



## Caps – be aware of pitfalls

- If you implement a capped rate structure you need to follow OMB guidelines. There are many pitfalls to be sure to consult with campus resources on how to implement
- Once you implement a cap structure, it is nearly impossible to go back
- You are better off setting the rates lower vs. implementing a cap



# Case study in Characterization Labs

- Recharge was capped by instrument
  - PIs would gather use into a single month to maximize advantage of cap
  - PIs would use a single instrument, even if an identical one was available to maximize advantage of cap
  - PIs that used a single instrument were reaping huge cap advantage at the expense of other PIs
- Solution and goals
  - Change caps to by PI group vs. PI by instrument and lower rates across board by 20%. This combination was calculated to result in a net zero change in recharge
  - Should redistribute demand onto under utilized instruments improving utilization
  - Encourage increased use by smaller users
  - Have single instrument PI pay a fairer share
  - Encourage use of other instruments
  - Reduce PI reliance on cap support
  - Don't negatively impact recharge



# Using rates to alter behavior

Goal	Outcome
Better utilization of identical instruments	Accomplished (61%/39% to 56%/44%)
Increase % use by smaller users	Accomplished
Single Instrument users pay fairer share	Accomplished
Encourage use of other instruments	? Hard to measure
Reduce PI reliance on the cap support	Cap support went from 43% of total to 21%
Don't negatively impact recharge	Accomplished





# Conclusions

- You need lab management software
- Rate structure has a profound effect on user behavior (both good and bad behavior)
- Rate structure has no effect on recharge – demand is elastic, \$ are inelastic
- Caps (especially hard caps) can lead to wasteful behavior and will affect other user's satisfaction and should be avoided
- There is a marked effect of # of grants on recharge
- You can accomplish operational and (some) financial goals by changing rate structure