

STATISTICAL CONSULTING...STAFFING WITH UNDERGRADUATES!?!



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BURKARDT CENTER HISTORY

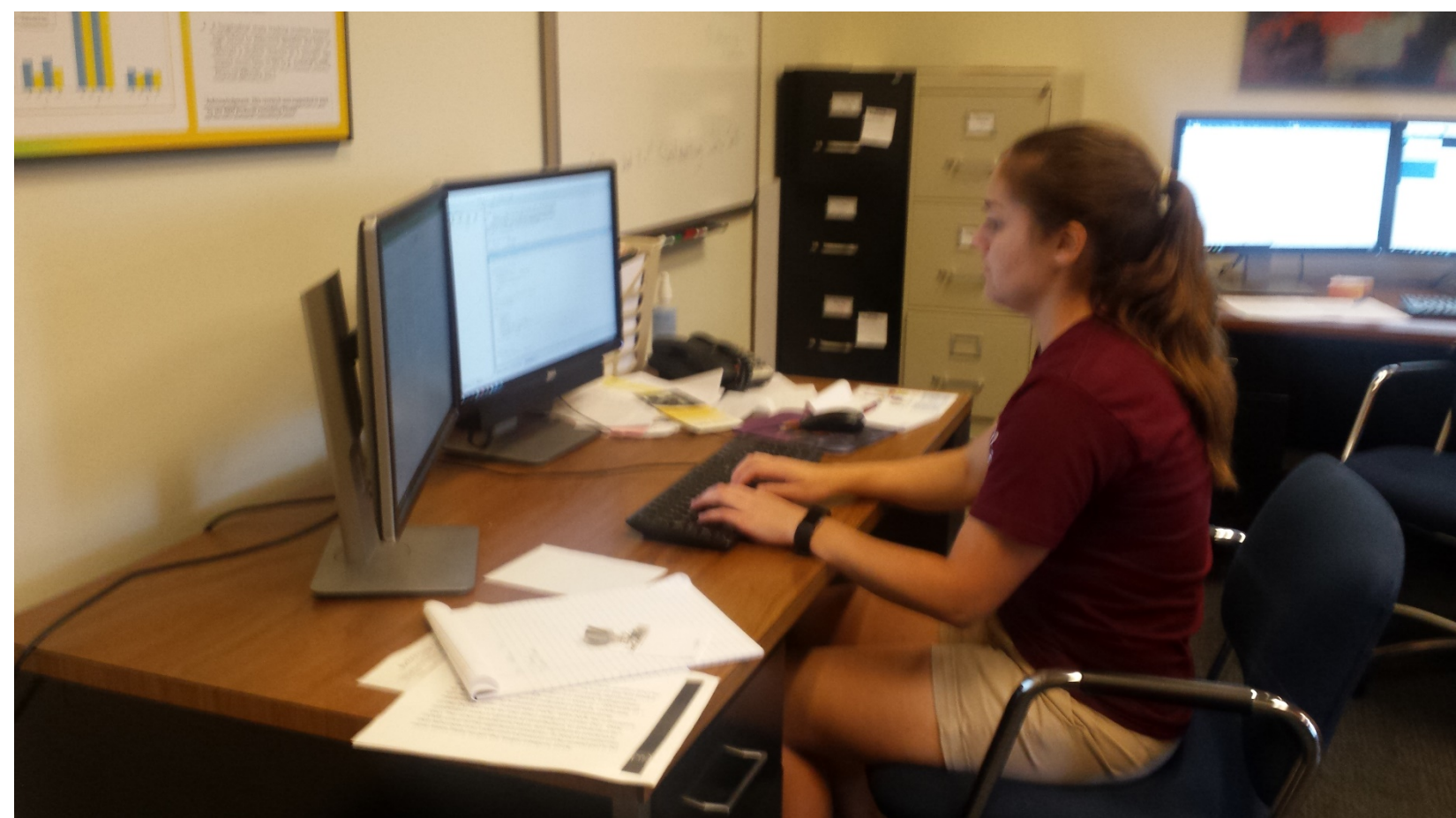
Established in 2001 as the *Mathematical and Statistical Consulting Center* by Andy Long (Mathematics) and Jim McKenney (Statistics); some support being provided by both the department and the college. In early years, the work of the center was quite balanced across mathematics and statistics, but it did not generate self-sustaining revenue.

Renamed the *Burkardt Consulting Center* in 2004 in honor of Tom Burkardt, 2003 Outstanding NKU Alumnus who established permanent funding for students working in the center.

From 2009 with the addition of the Statistics Major, leans heavily in the direction of statistics including clinical trials. By necessity also becoming more revenue based.

LOGISTICS

Space: An office suite with 2-3 computers having appropriate software works nicely. Server storage with universal log-in capability is ideal. Dual monitors on every computer are highly acclaimed by consultants.



Advertising: Digital signage across campus and a lot of "word of mouth".

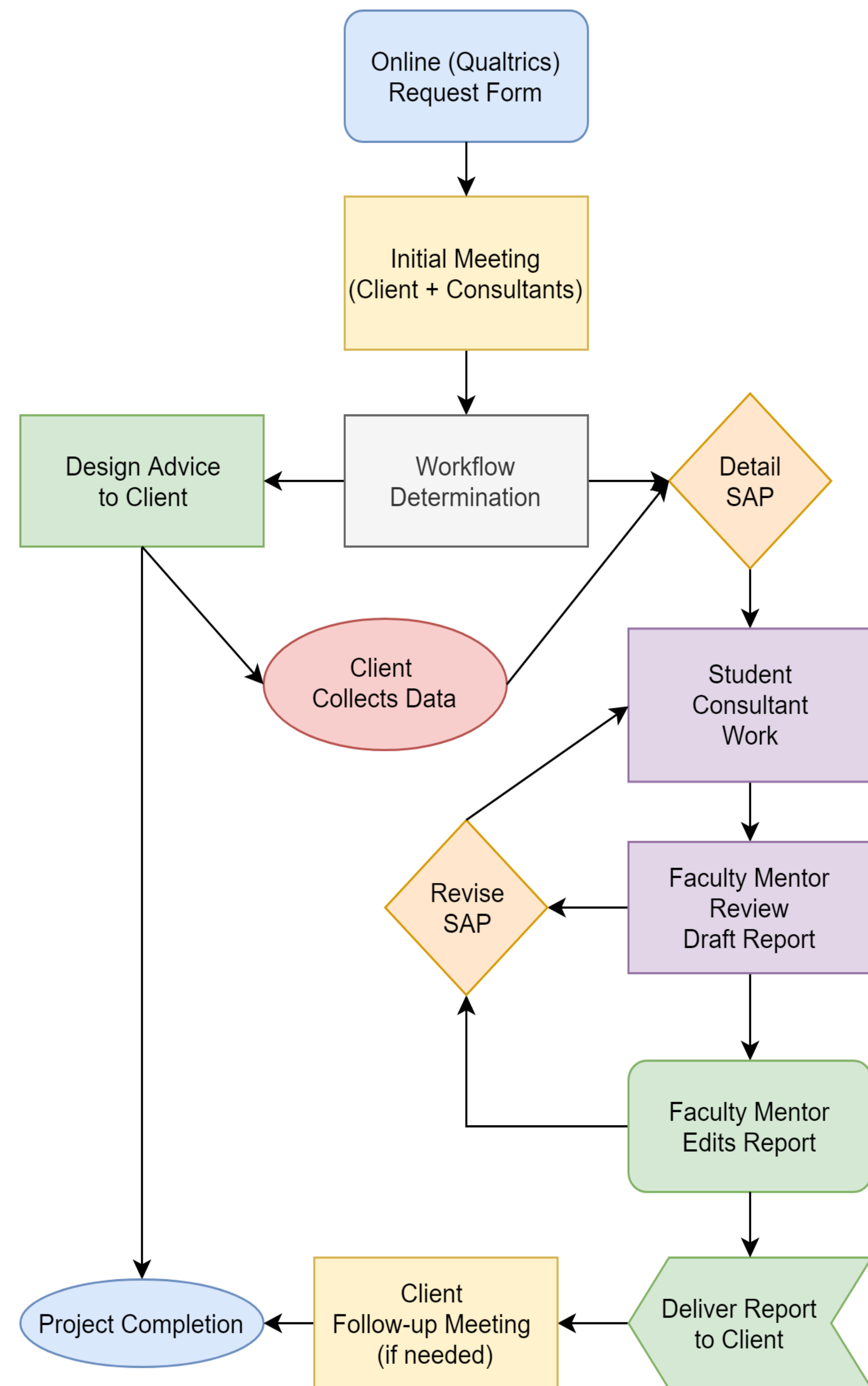
Protocols: A set of clearly defined SOPs addressing everything Mission, Workflow, Fiscal Policy, Record Keeping, Data Storage, Ethics, and Co-Authorship.

Consultants: Ideally (but not always) Statistics Majors in their Senior year. Common double majors include Mathematics and Data Science. Aim for 4-5 at a time, each working for 2 semesters (or occasionally 3). Students work approximately 90 hours per semester.

Training: All employees are required to complete CITI training and be familiar with appropriate human subject protections. Most other training occurs on an as-needed basis.

Records: Fillable forms are created in MS-WORD, including a Client Log (our own notes / plans related to a given project) and a Project Report Form (this helps guide student consultants as they write the first draft of each client report).

WORKFLOW



Who are the clients?

- Community based healthcare organizations (including support for clinical trials)
- Other miscellaneous organizations and/or businesses within the Cincinnati region
- Students and faculty in NKU's College of Health Professions (both graduate and undergraduate)
- Graduate students and faculty in NKU's College of Education
- Other students and faculty from a variety of disciplines

KEY POINT: Word of mouth is primarily how external healthcare-based consultations have grown.

Key to the success of our consulting projects is interaction between faculty mentors and student consultants. This interaction takes place at many levels throughout the workflow, and we find it important to design workflow to specifically accommodate that interaction. Some specific points:

Request Form: Obtains demographic, budget, and billing information. Equally important to obtain project design information that is reviewed by both faculty and student consultant prior to the initial meeting.

Initial Meeting: Ideally, all stakeholders are present (faculty and student consultants, client, client colleagues and/or advisors especially if student client).

KEY POINT: Data are not analyzed during the initial meeting.

Goal of the initial meeting is simple – immerse into the client discipline and well understand the project goals.

Statistical Analysis Plan (SAP): Plans are discussed with the client during the initial meeting. If data are to be immediately analyzed, both the faculty mentor and student consultant then outline, in writing, the SAP. This helps to keep the work on track and also helps to ensure that nothing is missed as the work bounces back and forth between the student and mentor.

Consultant Work / Mentoring: Students are allowed to work as independently as possible to complete necessary analysis. They are also encouraged to seek mentor assistance whenever they get stuck on anything.

KEY POINT: The likely need for revision is not only expected, but part of our designed workflow.

Faculty mentors review the work at various intervals, depending on the size of the project, working with the student as needed to implement any necessary changes.

Reporting to Client: In contrast to graduate consulting centers, most statistics students even in their senior year are not expected to produce an industry quality report. In particular, draft reports are often too technical in nature and must be distilled down into information that the client needs and can easily understand. Editing the report to this standard is one area that generally must remain the responsibility of the faculty mentor, especially for external projects. It is also an avenue for student learning, as students are asked to review the final report simply to learn from the edits having been made. Final reports are sent to clients and follow-up meetings are scheduled as necessary.

FINANCIAL ASPECTS

Free vs. Invoiced: There are advantages and disadvantages to both, however the BCC does incorporate a graduated fee scale (\$20 per hour for NKU students, \$35 for faculty, and \$50 for external clients). These fees are still well below the level of private consulting fees.

Key Point: Both parties benefit from the fee structure, as clients pay far less than they would for private consulting, while students gain valuable experience.

To encourage large projects of value to students' experience, we also occasionally contract projects for a specified or reduced hourly amount.

Funding: Student consultants are paid from an endowment resulting from alumni donation. This allows earnings to pay for faculty reassigned time. Including summer, the center covers approximately 8 reassigned time for faculty each year. Student consultants also earn credit for the internship. Lacking the endowment, a model where students only earn credit could still likely be supported.

CENTER OUTCOMES

Internship Experience for Math/Stat Majors

- More than a third go on to Graduate School in statistics or a related area
- Others go directly into industry, applying their statistical training for companies such as Kroger, Medpace, 84.51, Proctor & Gamble, as well as several different banks and insurance companies.
- More than half provide feedback that indicates the consulting experience has been an important component of their interview process

Projects supported (ranging anywhere from one to a hundred hours):

- 25-30 external projects per year
- 20-30 faculty-initiated projects per year
- 30-40 student-initiated projects per year

ACKNOWLEDGEMENTS

All data used in the creation of this poster were collected for the purpose of program evaluation and not for research purposes. Thanks to 2018-19 BCC student consultant Parker Kain for his contributions to the poster and presentation.

Burkardt Center Website
<https://nku.edu/bcc>