

Title: MNSU Enrollment Projection Planning Tool

Minnesota State University, Mankato is facing some serious budget problems. One of the core reasons for this is that the administration doesn't currently have a good way of predicting exactly how many students are going to need to take which courses in the semester that follows the current one (or the semester after that). Not being able to predict that means that there's a lot of guessing that goes on around what courses (and sections) should be scheduled and how many students will sign up for them. Guessing is never a good thing, of course. And in our case, it often leads to pretty poor financial and operational performance. Fixing this problem across the university would go a long way towards reducing our budget pressures – in a big way.

It's not that we don't have the data that would allow us to make really good, accurate projections – we do! The problem is that we don't take advantage of the data. There are a lot of reasons for that, some of which are more reasonable than others. But overall it seems possibly fair to say that the problems is simply a lack of imagination. We've never done it, no one has really worked out what it would take to do it, it seems like it might be hard and messy, and so....it just doesn't get done. And we keep wasting money.

This project is about proving that it is **TOTALLY DOABLE** to start with data about current students, their current earned credits, their declared programs of study, and based on that....predict what classes should be offered in the next semester (or two!). The project will focus on developing core algorithms that work (initially) through simple CLI or file-based interfaces. (In other words, this is not a UI/GUI project.) Development work will be done primarily in Python and Python-friendly libraries and packages. Data interfaces may include SQL and Microsoft Access.

The project team will work with both synthesized and “scrubbed” student enrollment data to avoid any conflicts of interest or violations of privacy policies and regulations. All the curriculum, course, and financial data we work with will be completely real.

If you want to use your superpowers and skills to make your university a better place to study and work – here's your chance!

The project client lead will be Lin Chase, the Interim Executive Director of Analytics and Planning for the University. Other administrators involved will be Jerry Orman, Amanda Eekhof, and Jennie Cashin, all of whom work with Lin.

| Deliverables | Type of work | Activities | Resources | Tech Skills | Priority |
|--|---|---|--|---|----------|
| Requirements Analysis Document (RAD) | Requirements analysis | Work with main client and her colleagues/SMEs to understand the details of what the planning tool needs to do, and why, and how. Includes requirements for dealing with various input/output data elements. | Client lead and SMEs, project coach | System and requirements analysis and documentation | High |
| Data Sources and Data Model Design and Plan Document (DSDM) | Data engineering and data model planning – what are the fields and structures of the data to be used? | Work with main client and her colleagues/SMEs to identify all useful and reasonably accessible sources of data to be used in construction of the planning tool. Define all data fields and structures | Client lead and SMEs. Project coach and online materials about data engineering and student data privacy | Data engineering, data model design and documentation | High |
| Data Gathering and Aggregation – data set to be used for development and testing | Creating the data set to be used for development and testing | If the client is able to support the needed data pulls (ETL), build the data set from actual client data. If not, create a synthesized data set to support the project. | Client lead and SMEs, project coach, and – if needed – online information about how to synthesize data sets against a data design plan | Data engineering, ETL tools, SQL, Microsoft Access | High |
| Software design document and lightweight test plan | Software design, test planning | Create and write up a plan for how to develop the desired software functionality and how to do lightweight testing as development is underway (and as it nears completion) | Client, project coach | Software architecture, software testing | Medium |
| Working, tested prototype | Application development | Prototype a “field use” (hospital use) app that wraps the predictor into an easy-to-use format for hospital staff (platform(s) TBD). | Client lead and colleagues | App dev (platforms TBD) | High |
| Presentation to administration officials | Present working prototype to University leaders | Present work and vision of what it makes possible | Client lead and colleagues, project coach | Technical communication | Medium |
| Handover document and digital delivery of completed work output | Working, documented project artifacts | Provide client with everything needed to use and maintain the software produced | | | High |