Proposed Project Detailed Description

This document is a guideline to help you think through the information needed to submit a detailed project description to Senior Design. This document is typically two to four pages long. It should contain an explanation of the project with some business justification, background information, high-level expectations, and any other supporting or overview information you feel necessary. This document describes your company and project to the Senior Design students on the first day of class. From these project descriptions, the students indicate their preferences for team assignments. It is beneficial for you to have a project description with enough detail to get the students interested in your project.

Not all sections of this document may be applicable for your specific project, topic, or organization. You should feel free to add, change, or remove sections in this document to fit your needs. The project's scope is negotiated between you and the student team during the beginning phases of the project and adjusted throughout the year.

We want to make sure that this venture benefits both the students and your organization as much as possible. We evaluate projects using the following criteria:

- Education value to students
- Interest to students
- Ability to have closure in an academic school year
- Relative independence from your staff, systems, and resources
- Innovative value to computer science and business
- Measurable impact for your organization

Project Description

UNL-TAPS Program – Streamlining TAPS Data

Sponsor Background

The University of Nebraska-Lincoln's Testing Ag Performance Solutions (TAPS) program was started five years ago as a new way to engage agricultural producers. The TAPS program is a unique farm management competition that promotes profitability and efficiency through peer-to-peer interaction. Profitability and efficiency are such important aspects of the agricultural industry and this program allows participants to test methods to increase these aspects of their operations. The competition, which was started by a group of UNL Educators, is housed at UNL's West Central Research, Extension & Education Center (WCREEC) in North Platte, Nebraska. Unlike a common yield contest, TAPS teams compete for three awards with the highest honor being awarded to the most profitable, followed by highest water and nitrogen use efficient and a third prize for greatest grain yield. Participants are responsible for making input decisions including hybrid selection and seeding rate, irrigation, insurance selection, marketing strategy and nitrogen fertilizer management. Each team's decisions are made utilizing an online portal (www.taps.unl.edu) and are implemented in the field on three randomized plots. Support from commodity boards, ag service providers, regulatory agencies and financial institutions in the past five years has allowed the program to expand its competitive offerings. Originally just a sprinkler irrigated corn competition, TAPS has grown to add a sorghum competition as well as a subsurface drip irrigated corn competition in North Platte. There is also a dryland wheat competition administered at the High Plains Ag Lab near Sidney, NE. Oklahoma State University has also worked closely with the UNL group to start an OSU-TAPS program that offers competitions in corn and cotton.

Project Overview

Primary Project:

Participants in the competitions submit their management decisions through a password protected online portal. Last year over a thousand decisions were submitted. These decisions pool into an excel report through the website and also generate individual confirmation emails to the participants and organizers for each decision. All decisions have to be logged into a main spreadsheet for the competition (attached a sample from 2020), and then also into individual spreadsheets for each competing team. This is a very time consuming and detail oriented task to record all of these decisions.

Our goal is to create a streamlined process, so this data automatically fills into not only the main decision page, but also each of the individual spreadsheets.

Our program may have the opportunity to grow in the number of competitions and also locations of the competitions so having this data collection & dispersal project streamlined would provide more efficiency to the project.

Long Term Project:

Using the data from the decisions made and entered into the spreadsheet, we would like to make a website that can generate this meta data into a searchable database for people to look at the current and past competition decisions, etc. This may also include web visualization of technology provided to participants, such as drone imagery, etc. This would require web design and automation so that data, and imagery, could be easily uploaded to the site on a regular basis.

Our goal with this aspect of the project is to help visualize the outputs of the competition. There is an insurmountable amount of data that comes from each year of the competitions and we would like an interactive and visually attractive way for people to see that information.

If we are able to share this information beyond the walls of our program, it will help our program grow and will have an even great impact beyond the people directly involved.

Project Stakeholders

This project would include the following UNL personnel primarily, with others involved on a minor level:

Dr. Daran Rudnick (Biological Systems Engineering Department)
Dr. Matt Stockton (Ag Economics Department)
Chuck Burr (Extension Educator)
Krystle Rhoades (TAPS Program Manager)

It is hard to list all the other individuals that will be impacted by this project, but here are some statistics about our program and the people involved every year:

- Over 150 participants (producers, college students, industry organizations, government entities) from 4 states
- Over 50 sponsors & partners, in products & services, as well as monetary donations including grant funding from USDA-NRCS, Nebraska Corn Board, United Sorghum Checkoff and Nebraska Sorghum Board.
- At least 3 other educational institutions that assist, or are building TAPS programs
- Hundreds, if not thousands, that hear about the TAPS program through social media, presentations, and field days.

Current System Overview

Currently, we are using the website to collect the management data which generates reports that can be used. Through the use of those reports or email confirmations that are sent to TAPS organizers, the main competition file (Microsoft Excel) is updated with the selections submitted. From there those decisions connect into each individual competitors spreadsheet (Excel), which are shared on their password protected online portal. A sample of the main competition spreadsheet as well as a competitor spreadsheet are attached to this document for review. A demonstration of the process will be provided in the introduction video.

As for the long-term project, we are not currently doing anything like this so would need assistance with getting this started. We have four, soon to be five, years of data that we could build the database on the competition decisions.

Proposed System/Scope

1. Business Justification

If this project is competed and the data collection and dispersal is streamlined and automatic, participants will have up-to-date files at all times. Rather than now it may take us a couple days or even up to a week to get their individual spreadsheets all updated. This helps the participants to know what decisions they have made and to help them make their future decisions.
The long-term project would be an output to showcase our program and make it more visualized and interactive for TAPS participants, sponsors and followers.

2. Proposed System Overview and Strategy

Our hope is to find a database solution to gather all of the submitted management decisions and share them to individual spreadsheets for each team. This may also include assisting in redesigning the website to assist in the data flow and design the meta data bank.

3. High Level Architecture Requirements (Technical Specifications)

We will be using the current UNL-TAPS website (www.taps.unl.edu). We currently use Microsoft Excel to collect and disperse the data but are open to other suggestions that may offer a better solution.

Supporting Materials (Sponsor Responsibilities and Provisions)

We have attached the following documents for review:

- TAPS Competition Project Description: learn more about the competitions we host
- TAPS Competition Decision File: main database of all decisions that come in throughout the competition.
- TAPS Individual Competitor Report: Shows all decisions, and provides the budget to competitors throughout the year.

The final report for each competition year which is our main way of sharing the data and results can be found at https://taps.unl.edu/reports.

Communication Plan

Since our team is located in both North Platte and Lincoln, we are open to having virtual meetings. There shouldn't be any need for travel.

Sponsor Contact Information

Name	Primary Contact (Y/N)	Email Address	Title	Address	Phone Number
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