5 Professionalism

This section is with respect to the paper titled “Contextualizing Professionalism in Capstone Projects Using the IDEALS Professional Responsibility Assessment”, *International Journal of Engineering Education* Vol. 28, No. 2, pp. 416–424, 2012.

5.1 Areas of Responsibility

One of the codes of ethics, related to this project, (IEEE, ACM, SE) were chosen and then added onto *Table 1* provided in, “Contextualizing Professionalism in Capstone Projects Using the IDEALS Professional Responsibility Assessment”. A new column was added upon this table at the end with a brief description of how the selected code of ethics connected to each area of responsibility next to the National Society of Professional Engineers (NSPE) column.

The chosen code of ethics to base the evaluation off of was Software Engineering (SE) code of ethics, and the resulting table can be found below. The resulting description is based on the SE code of ethics for each of the seven professional responsibilities of the table.

The seven areas of professional responsibility in the assessment instruction with an additional column of the SE code of ethics outlined in “Computer Science and ACM Approve Software Engineering Code of Ethics”, *Computer Society Connection* pp.84-88, 1999.

Area of responsibility	**Definition**	**NSPE Canon**	**SE code of ethics**
Work of Competence	Perform work of high quality, integrity, timeliness, and professional competence.	Perform services only in areas of their competence; Avoid deceptive acts.	Accept responsibility for one's own work while only approving software that is safe, meets requirements, passes appropriate tests without negative effects on quality of life.
Financial Responsibility	Deliver products and services of realizable value and at reasonable costs.	Act for each employer or client as faithful agents or trustees.	Ensure products, manufactured and modified, meet the highest of professional standards possible to ensure the utmost financial results.
Communication Honesty	Report work truthfully, without deception, and are	Issue public statements only in an objective and truthful	One must accept responsibility for their work while not knowingly

	understandable to stakeholders.	manner; Avoid deceptive acts.	working in an illegal or unethical manner.
Health, Safety, and Well-Being	Minimize risks to safety, health, and well-being of stakeholders.	Hold paramount the safety, health, and welfare of the public.	Approve software that won't diminish quality of life, harm the environment, and diminish quality of life while being fair and supportive to colleagues.
Property Ownership	Respect property, ideas, and information of clients and others.	Act for each employer or client as faithful agents or trustees.	Keep confidential information of any client while ensuring proper documentation and evidence of nonproprietary or breach of property or ideas.
Sustainability	Protect the environment and natural resources locally and globally.		Do not purposefully accept software that will harm the environment.
Social Responsibility	Produce products and services that benefit society and communities.	Conduct themselves honorably, responsibly, ethically, and lawfully so as to enhance the honor, reputation, and usefulness of the profession.	End products should be of the highest professional standard with proper procedure in ethics in the development process with the hope of also participating in lifelong learning, and advance the integrity and reputation of the profession.

The SE code of ethics differs from the NSPE code of ethics in each area slightly due to it being a code based around a more specific area of engineering than the broad area of NSPE. The following is grouped based on each of the seven professional responsibilities.

For the responsibility "Work of Competence", the difference between the two codes can be seen from the more broad perspective of NSPE as it is specifically concerned with engineers performing tasks specific to their training while the SE code is specific to the work of software engineers.

For the responsibility "Financial Responsibility", the difference comes from the SE code of ethics being not just financial responsibility toward employers or clients, but also general use of data and computer resources that may lead to undue financial burdens.

For the responsibility “Communication Honesty”, there is not a really substantial difference as the responsibility of communicating honestly to any party involved in any sort of project should be done without any deception or omission of facts for either code of ethics.

For the responsibility “Health, Safety, and Well-Being”, in a similar way to the communication honesty responsibility of not really being different in any real important means. It is simply a more specific statement for the SE code of ethics.

For the responsibility “Property Ownership”, is another responsibility that is not that different between the two codes as this responsibility is dealing with the respect towards one’s property and ideas which is consistent across any engineering project. The general conclusion is to properly act as a trustee of information for all those involved in the project.

For the responsibility “Sustainability”, the NSPE code of ethics was left blank in the original table of the seven responsibilities making this section a clear difference between the two codes. As for the SE code of ethics, the responsibility breaks down to any code that one develops should not actively have a negative impact on the environment.

For the responsibility “Social Responsibility”, is the final responsibility and is relatively similar between the NSPE code of ethics and the SE code of ethics as they both relate to the purpose of creating quality work at the highest level that will be done in a lawful manner while advancing the integrity of the profession.

5.2 Project Specific Professional Responsibility Areas

This section includes a brief explanation of the applicability and the degree to which the team has fulfilled each of the seven areas of professional responsibility that can be found defined above in the table of section 5.1 Areas of Responsibility.

“Work of Competence”: As this means, “Perform work of high quality, integrity, timeliness, and professional competence”, this clearly applies to the team’s project in a professional context. This is because we want to be able to meet these attributes in the work that we put in. Our work should be of a high quality, while still getting completed in a timely manner with the professionalism that would be expected of us in a real work environment. The team, to this point, have been performing, in this professional responsibility, really well in getting work done to the level that would be expected while maintaining a competence towards the professionalism of how we do so. Giving a rating of either the high end of medium or just in the high degree of level.

“Financial Responsibility”: This responsibility applies to our project closely. The goal for the final product is to not only save the company time when working with underground cable bore holes, but also reduce unnecessary spending caused by disagreements between the company and its contractors. Our project will have this in mind, and maximize the time and financial benefits through deliberate design decisions. In addition we will also reduce the cost of operating and maintaining the tool that we create. Our team is performing highly in this category. We have

created a design that fulfills the requirements described above and have considered the cost of long-term operation as well.

“Communication Honesty”: As we continue developing our project, we have strived to maintain full clarity on what we are doing and what our objectives are. Doing such keeps everybody involved well-informed on our decisions. This applies to this project because of the need to keep everyone informed between the team members, the advisors, clients, and teaching assistants. The team has successfully managed to maintain excellent communication throughout the entirety of the project planning and design process up to this point. This has been done with an instant chat communication method between team members, advisor, and teaching assistant, along with regular meetings. As well as communication with clients and other resources through school email with a designed format. As far as the honesty aspect, our team has been accurately portraying the project information truthfully to all stakeholders, team members, and everybody else involved .

“Health, Safety, and Well-Being”: Our application will be used to calculate the size of real-world underground bores and thus how much land will need to be moved to install the cables needed. By minimizing bore sizes, we reduce the impact on the environment albeit in a relatively small way. We must ensure that the calculations to determine bore size are correct and can be relayed to the user effectively so they can apply their estimates.

“Property Ownership”: While there is no physical property, information and ideas are highly relevant to the scope of our project. Alliant Energy has provided us with insights into their inner workings, and have trusted us with this. We believe that our team is performing at a high level to rate it. We have kept all information shared with us to ourselves, and have not distributed or shared it beyond our circle of which it is relevant. Additionally, we have met with representatives from their company in order to hear their ideas and tailor our project in order to accommodate, as their insight has been helpful in understanding the use cases. However, while we asked about NDA, they only recently got back to us and requested to have IP rights. We are still in conversation to determine if IP rights are what we want to agree to however.

“Sustainability”: We want to ensure that while our project will not produce any physical products, we can still be responsible for how many resources we use to host the application on various servers. While we do not have total control over how the servers themselves hosting this application will be run, we can ensure that we are not using high-power servers that would be better suited to heavy computing since our application should require minimal processing power. This does mean optimizing our code to only run calculations when necessary rather than all the time to reduce energy consumed by a server processor.

“Social Responsibility”: We want to ensure that our project is done to the best of our ability. Although we still have things to learn in regards to the technology and methodology we chose for our implementation, we will do it to the best degree possible. We will not be dealing with confidential or proprietary information, as this is a publicly and freely available tool, available to anyone who wishes to use it. However with that being said, we will be restricting who can update the publicly available profiles via an organization admin account to trusted individuals at

said user companies. While this project is not yet complete, we hope the end result will be of high quality and provide a positive example of the software and computer engineering professions.

5.3 Most Applicable Professional Responsibility Area

For this section, one area of professional responsibility that is both important to this project and the team has demonstrated a high level of proficiency in the context of this project. This includes a description of how this responsibility is important to this project, the ways in which the team has demonstrated the responsibility in the project, and the impacts that it has led to for the project.

While there are multiple professional responsibilities areas that the team has performed really well thus far, one of the most applicable areas would be that of Communication Honesty. The team has a strong communication system setup for all of the types of communication that needs to be done. To add to the area of honesty, the information that has been communicated has been truthful without the intent to deceive, and if there were any uncertainty or miscommunication the team members would work to remedy the situation.

This has led to the transparency of the work that the team has been doing, and the effectiveness of the exchange of information has allowed the team to fully figure out project requirements, scheduling, and all of the necessary design decisions. There have been difficulties that have occurred during the project that have led to the need for more in depth communication or extra meetings between appropriate parties. The team's communication system and communication honesty has helped to facilitate the alleviation of these difficulties.