Processes to Formalize Sponsored Educational Activity Agreements between Industry and Universities Related to Capstone Design Projects*

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Capstone programs have evolved over the years from small, mostly internally sourced projects with paper-based outcomes to externally funded, industry sponsored projects delivering fully functional prototypes or test fixtures. This increased level of project sophistication and expanded cast of stakeholders has motivated academia and industry to more carefully evaluate the risks and rewards of capstone design programs. This paper surveys institutions across the country that have posted policies and procedures to manage legal as well as contractual issues associated with capstone projects. Findings are discussed in the context of case studies at the University of Idaho and at California State University, Chico spanning the last five years. Both cases illustrate a delicate balance between satisfying needs of university risk management entities and promoting exemplary service learning outcomes. Important issues identified for consideration in industry and student agreements include intellectual property rights, handling confidential or sensitive information, export control, budgeting, overhead rates, billing, indemnification, turnover of project deliverables, timing of project legal documentation, and sign-off by authorized representatives. Points of alignment with activities of the University-Industry Demonstration Partnership are also noted. Issues and best practices outlined in this paper should increase the comfort and satisfaction of all stakeholders involved in externally-sponsored educational projects, including service learning courses in every discipline.

Keywords: sponsored research agreements; contracts; capstone projects; service learning

1. Introduction

Capstone design programs lead to better learning [1, 2], increased interaction with industry, student interaction with potential employers, and the opportunity to advance and apply new technologies for greater economic prosperity for the region and state. Institutions pride themselves on the amount and nature of service learning embedded in their academic programs. Alumni often serve as project mentors/clients, which is a catalyst for sustained involvement in annual giving programs. Capstone project work is a natural nexus for industry involvement in program design and program assessment. Challenges in formalizing sponsored educational activity agreements should not detract from these missions.

There are many different types and styles of capstone programs at both public and private four-year universities throughout the United States [3, 4]. Over the years, these programs have become more advanced, more demanding, and inherently more complicated, bringing together four distinctly different stakeholders: institutions, industry, faculty and student. While the fundamental goal is to provide an impactful learning experience for undergraduates that prepare them for future professional employment, there are many ways to administer a program. Many programs rely on developing a strong relationship with industry sponsors [5–8], however there is limited information in the education literature about how to define and acknowledge this relationship, and, in turn, what written agreements should exist, if any, between institution, sponsor, faculty, and student.

The goal of this research was to identify and present best practices for administering capstone programs and to share case studies surrounding industry and student agreements at two public universities, University of Idaho (UI) and California State University, Chico (CSUC). These resources and procedures are derived from several decades of developing and teaching capstone programs in engineering and business at two universities, numerous discussions and negotiations with institutional research administrators and state agencies, literature reviews of capstone programs and industry and institutional partnerships, and

online, telephone, and questionnaire surveys. A baseline of current practices was sampled at the 2014 Capstone Design Conference and augmented with a web survey and literature review to identify needs and values of all stakeholders as well as to frame areas where formal agreements pose significant challenges. Two alternative formal agreement systems that enhance, secure, and protect all stakeholders are given in links within the references. Timelines are also suggested for implementing these agreements, including milestones and approximate lead times.

2. Current administrative practices: baseline

Establishing the baseline of current practices was accomplished through several different data collection methods. Data were collected during a survey of capstone engineering programs at CSUC. Fourteen capstone programs were contacted and questions were answered regarding cost of sponsorship, executed agreements, and intellectual property (IP) rights. These data were combined with two other surveys conducted via institution's websites and a survey circulated during the 2014 Capstone Design Conference. These surveys explored questions related to cost of sponsorship, required agreements, IP rights, indemnity, publishing restrictions, and export restrictions. Both these datasets were combined and a summary of the results are provided in Table 1. Twenty-seven different engineering capstone design programs are represented in these data from 22 public and 5 private institutions.

Approximately one-quarter of respondents indicated that there is no formal agreement between the institution and sponsor while one-quarter execute a formal agreement and another one-quarter provide an application or informal contract. Six respondents indicated that their students are required to sign an agreement with an additional five other respondents specifically providing or allowing students to execute an NDA, if requested by the sponsor. Surprisingly, many institutions left blank or indicated that they do not provide an agreement that explicitly allows students to publish project results. How IP rights are managed among the 27 institutions varied considerably with four institutions either prohibiting or not providing a means to assign IP to the sponsor, while 12 institutions assigned or at least provided the means to assign rights to the sponsor. Twenty-one out of 27 respondents indicated that there was no provision for holding harmless either the institution or sponsor from a claim arising from the project outcomes.

Additionally, cost of sponsorship ranged from a low of $2,500 to a high of $50,000. The most common amount was between $5,000 and $15,000. However, over five institutions offered sponsorship amounts at or above $20,000. Four programs based the amount on the scope of the project whereas eleven institutions required a fixed donation amount that was not associated with project deliverables. These results show little consistency in administering capstone programs at the 27 institutions surveyed.

3. Stakeholder needs and values

To administer a successful capstone design program, it is important to understand the unique needs and values of all stakeholders. Clearly, these different stakeholders have different needs and requirements. Industry generally desires access to advanced research, specialized equipment, and access to new talent for recruitment. Their values are often at odds with academic institutions because of the competitiveness of what they do whereas academic institutions and faculty value open dissemination of knowledge, processes, and know-how and typically have a longer time horizon for determining project success. Students are in a develop-

Table 1. Survey of Capstone Administrative Practices

	Yes	No	Other	Case-by-case	No Response
1. Is there a legal agreement signed by the university legal counsel and the capstone project sponsor?	7	7	5	–	8
2. Do students have to sign an IP and non-disclosure agreement (NDA) where the IP is transferred to the sponsor either directly or indirectly through the University?	6	3	5	5	8
3. Are there provisions that allow publishing of agreed upon project results?	5	2	–	–	20
4. Has your institution found a means of transferring IP to the sponsoring institution?	12	4	–	9	2
5. Is the University and project sponsor explicitly held harmless for any claims arising from project implementation or design?	5	1	–	–	21
6. Are projects with export restrictions allowed?	1	8	1	–	17

Table 2. Stakeholder Needs and Values

	Student	Faculty	Institution	Industry
Needs	Fulfill course requirements	Recognize efforts for promotion and tenure	Create and maintain strong reputation	Remain competitive in the market
	Engage in interesting projects	Fund technical and administrative support	Maintain facilities and administration	Benefit from students and technology
	Maximize team experience	Meet sponsor's needs	Minimize risk and limit exposure	Secure confidential information
Values	Experience with industry	Contribute to student learning and success	High profile program	Benefit from PR opportunities
	Opportunities for job placement	Exposure to industry research needs	Create long term partnerships	Exposure to new talent for recruiting
	Meaningful industry project	Collaboration with industry	License new technologies	Commercialize technologies
	Opportunities for creativity and innovation	Freedom to explore new technologies and pedagogy	Create predictability and security	Quick to market
	Being in the moment	Long term vision	Long term stability	Task oriented

mentally transitional phase where they are accustomed to responding to faculty requirements and do not often take a proactive approach to their growth, and yet, they need to assimilate into industry; direct exposure to industry partners is extremely valuable. Academic institutions are trying to mitigate exposure to risk and liability and manage their faculty, students, and research. However, institutions often lack direct authority to be effective. Additionally, institutions are often mandated by a governing board to secure and maintain IP but lack the ability to monetize it, and they are generally administratively more complex than industry and therefore slower to respond. Coordinating these distinctly different stakeholders is a challenge, but it begins with an understanding of needs and values.

Several sources were used to establish stakeholder needs and values. Todd and Magleby [9] summarize the values, constraints, and issues with regard to students, faculty, and industry sponsors participating in externally sponsored capstone projects. Their assessment does not include the educational institution and does not make recommendations for contractual agreements based on the various stakeholder needs and values, however their insight was used to identify many of the needs and values used in this study.

University-Industry Demonstration Partnership (UIDP) resources were reviewed to identify stakeholder needs and values. Their resources are available to help educational institutions and industry create robust and effective sponsored research agreements (SRAs) [10, 11]. These resources focus on large multi-million dollar research grants for basic and applied research. However, many of the principal ideas do apply to senior capstone programs.

Table 2 summarizes student, faculty, administration and industry needs and values, which are adapted from the authors' experience, UIDP [10, 11] and [9].

4. Challenges in administering capstone programs

Because there are distinctly different stakeholders that must all come together and coordinate, there will inevitably be challenges in managing all needs. Additionally, some needs and values are aligned across all stakeholders while some are at odds. For example, the need of a student to complete the course requirements, which often includes publishing or publically presenting results are at odds with a sponsor's need to maintain a competitive advantage in the marketplace. Whereas, the need of the student to complete the program successfully supports industry's need for maintaining a competitive advantage and the institution's and faculty's needs to be recognized for their program and achievements. Needs and values of each stakeholder were analyzed to determine the conflicting or overlapping needs between each stakeholder. Table 3 identifies the specific challenge or issue and corresponding stakeholders. Issues that overlap between stakeholders are identified with an 'O', whereas a 'C' indicates that a stakeholder's values or needs are in conflict with others.

4.1 Intellectual property rights, confidential information and export control

IP rights are a concern of all parties. A sponsoring entity, especially one that shares its internal needs and existing technology, wants to own any IP that it commissions. However some institutions, like the

Table 3. Conflicting or Overlapping Stakeholder Needs and Values

Needs or Values	Student	Faculty	Institution	Industry
IP Rights	C	O	O	C
Confidential Information	O	O		C
Export Control			C	C
Budgeting		C	C	C
Overhead Rates		C	C	C
Billing		O	C	O
Indemnity			C	C
Warranties/Guarantees		C	C	C
Turnover of Deliverables	C	O		O
Signature Authorization			O	O

C: Conflicting, O: Overlapping.

University of Idaho, are governed by an educational board or similar public entity that mandates any IP developed at the institution be owned by the institution.

Most educational institutions value sharing knowledge and publishing methods and results, whereas private industry does not value public disclosure. Private industry goes to great lengths to secure and protect its proprietary IP. This could be trade secrets, copyrights, know-how, patents, and trademarks, among other assets. Convincing a private sector sponsor that their IP is safe within an educational institution requires additional processes and protection.

Additionally, most students do not have experience managing confidential information. Sponsoring companies often have proprietary information that is carefully managed and protected from public disclosure, and depending on the organization, employees may sign a confidentiality agreement and participate in IP and confidentiality training when first hired.

Based on the survey results, 8 out of 27 institutions do not assign IP rights to the industry sponsor; either the students or the institution retains ownership rights. Twelve out of 27 institutions do assign IP rights to the sponsor, some explicitly by way of an assignment clause in a sponsor agreement and some as part of case-by-case negotiations. Over half of the universities surveyed either have no provisions for transfer of ownership of IP developed in the course of a sponsored engineering capstone project or do not assign the rights. Without the possibility of securing and owning IP, from the perspective of market advantage, there would be little incentive for a company to engage in and sponsor capstone projects.

U.S. Export Administration Regulations (EAR) and International Traffic in Arms Regulations (ITAR) regulates and monitors polices and technologies developed within the U.S. that have national security implications or advantages. Some basic and applied research at universities or private companies falls under these restrictions and must be registered or licensed with the U.S. Department of Commerce. However, most research that is disclosed, communicated, and shared in the public domain at many educational institutions is exempt from export control under the Fundamental Research Exclusion (FRE). However, it is the responsibility of the entity that produces the technology to know whether or not it is or could be restricted due to the nature of the technology. Academic institutions often avoid projects that involve export restrictions.

4.2 Budgeting, overhead rates, and billing

Funding levels for capstone projects are commonly on the order of $5,000. This is supported by survey results that indicate nine out of 27 projects are funded at amounts between $5,000 and $10,000 with an additional four funded on a case-by-case basis according to project scope. Traditionally, an educational institution levies an overhead rate on any externally funded research project or grant. This levy ensures sufficient funds for overhead and the administration and management of all grants and contracts as well as providing the necessary support staff and equipment to operate ancillary equipment and facilities. In many cases, the overhead rate is on the order of 45% of any dollar coming to the institution. This cost structure is in contrast to private industry that generally operates on leaner principles and meticulously drives down overhead and the associated general and administrative (G&A) rates.

The relatively small capstone project budgets pose additional problems for faculty and staff overseeing them. With limited funds, the timing of when the funds are available does not often coincide with when the work needs to begin or when equipment must be purchased. Waiting on signatures and funds to transfer in order to make a small purchase limits project effectiveness and gets in the way of project learning and student development. While the money that comes in to the institution is

external, and since the amount of money is relatively small, the procurement process should be more transparent, less expensive, and easier to navigate than traditional research grants.

Most grants and contracts that are administered by the University are research oriented where the amount of time allocated for these projects must fit into a faculty's position description of aggregate research time. If the time allocated is greater than the total time in the position description, then the grant or contract must cover that portion of a faculty's wage over the specified amount. Based on the size and scope of the budgets for capstone projects, there are not sufficient funds nor justification to support research faculty salaries.

Finally, the management and administration of capstone projects should be nimble. Many projects are vetted and coordinated by faculty, however students do not get involved until part way through a semester. And, in some cases, funds are not made available until an agreement is executed by institutional administrators and sponsoring management. Prior to executing an agreement, it is often necessary to list the agreed upon action items or tasks with the associated budget estimate. This process can be lengthy and without a signed agreement usually work cannot commence. Capstone instructors need administrative flexibility in securing an adequate selection of projects in short timeframes before the start of the semester. Also, greater flexibility can help get students involved early. Once project teams are assigned, rapid start-up is needed even though it typically takes a month or longer to process necessary paperwork.

4.3 Indemnity, warranties, and guarantees

Indemnification is a common clause in corporate contracts and agreements. It is designed to protect one party from the actions or omissions of another party within a mutual agreement or contract. If indemnified, one party cannot seek damages for a loss that is associated with the other party's actions under contract. Indemnity reduces a company's exposure to risk. Frequently, however, public institutions of higher education are governed by statutes that prevent employees from signing or approving an indemnity clause for anyone other than themselves. Additionally, some states do not allow universities to obligate funds to cure a disagreement or breach of an agreement or commitment. Only the state legislature is authorized to commit funds, and therefore an indemnity clause can be an unfunded liability. This situation may not be immediately recognized by the sponsoring company and their legal counsel may push hard to get a public institution to accept liability for future damages arising

from contracted work when in fact the issue is non-negotiable.

Educational institutions, faculty, and students operate under an assumption that some research may not lead to a practical result, and in some cases, may even lead to a dead end. This understanding is counter to industry's view of research and development because of the high degree of market pressure and performance requirements imposed by managing boards and/or shareholders. Industry would like to have guarantees or warranties for the products they purchase from contractors. Institutions typically want deliverables to be provided "as is" with no explicit warranty or guarantee. For capstone projects, providing a guarantee or warrantee is especially problematic because the technical know-how is often held by a graduating student. Once the student graduates there is little a university can do to enforce accountability or resolve issues.

4.4 Turn-over of deliverables

Project deliverables must be handed off within a fairly narrow window of time and must be acceptable by the project sponsor, faculty, and student. This constrained time period requires careful management of stakeholder expectations. Sponsors are accustomed to being able to withhold some portion of payment until a project is delivered and completed to the satisfaction of the agreement. Because most capstone projects require approval and commitment a priori, a sponsor no longer has the leverage of payment to use to their advantage. Faculty can use the incentive or leverage of the student's final grade to encourage satisfactory completion. However, the student's final grade is often not sufficient to guarantee successful project deliverables. And, students vary significantly in their desire to deliver a successful project and in their recognition of quality work. The guiding principles or rubric for the project is typically found in the project specifications, but when there is little downside to delivering a less than adequate project to the sponsor, some students do not fulfill their obligations satisfactorily. They can become distracted with graduation and future endeavors resulting in less than full engagement to deliver the final product. There is also little leverage either the institution or the sponsor can apply once the academic term ends.

4.5 Signature authorization

Securing approval and signatures from sponsors and institutions is an important step toward managing expectations and ensuring satisfactory deliverables. However, discussing, understanding, and negotiating agreements takes time and often signature authority resides in members of both institution and sponsor at levels outside of the day-to-day

capstone activities and project understanding. Submitting agreements for signature may also require a personal follow up and conversation debriefing the administrator or executive of the proposed project.

All institutions that provide externally sponsored educational activities have unique strategies and missions and serve constituents differently. There are also a variety of ways to administer these capstone programs as identified in our recent surveys. However, by understanding the needs and values of all stakeholders and recognizing the challenges inherent in collaborating with each stakeholder, programs can better manage the process of formalizing educational activity agreements.

As capstone programs at UI and CSUC evolved over the past twenty and ten years, respectively, processes have become more formalized, predictable, and streamlined. The following case studies describe the changes that took place at each institution and the resulting best practices that were developed and are now used.

5. Case study: creating outreach and engagement programs at University of Idaho

Originally, capstone programs consisted of small student teams working directly with faculty to advance or create a design. They were largely unfunded and the deliverable was a paper design or feasibility study. Now, UI capstone programs are recognized leaders in experiential learning with a highly publicized engineering exposition held every spring. This university signature event hosts industry sponsors, judges, and hundreds of attendees. Achieving this level of success required a cultural shift at the institution and a recognition of the value and meaning of a capstone program.

5.1 Cultural shift

Reconciling perspectives of university counsel, offices of sponsored programs, risk management, and faculty involved in service learning projects has been difficult. At the University of Idaho, a cross-campus task force was selected to examine best practices at other universities, conduct focus group sessions, and make recommendations to the president and provost about how best to structure outreach and engagement, which is where capstone projects reside. After meetings that spanned two years and included two university-wide workshops that involved over 170 people, the task force delivered their report [12].

The report drew distinctions and supplied definitions for some of the terminology surrounding outreach and engagement (i.e. outreach, engagement, scholarship of engagement, distance education, professional development, service learning, cooperative education, extension, technology transfer, and professional service). The task force discovered and documented many promising strategies for strengthening outreach and engagement. These included university-wide councils; senior positions responsible for relationship building and advocacy; engaged student learning centers, mini-campuses around the state; and focused learning/demonstration projects. The report also made recommendations for expanding and elevating university-wide outreach and engagement including the following infrastructure and incentive programs.

An Outreach and Engagement Council (OEC) was created to champion and coordinate both within and outside the university, including regional centers and extension programs. Two of the authors have served as representatives on this body since its inception in 2009. The Office of Community Partnerships was created to advocate for service learning, extension activities, and scholarship of engagement. The director of this office has equal voice within the President's Cabinet and Provost's Council as the Vice President of Research.

Position descriptions, annual evaluation criteria and forms, and tenure and promotion criteria were changed to reflect an elevated role for outreach and engagement. Administrative processes and policies were identified and streamlined including travel, overhead rates, contract language, approvals, and invoicing. Marketing and communications opportunities were identified within and outside the University to promote outreach and engagement activities, accomplishments, and opportunities. This included a prominent web presence, campus-wide awareness about service learning, and visibility in national classifications/award programs.

At the University of Idaho, the minimum time allowed on a research contract is two percent. However, if a faculty member had 20 capstone projects, then a minimum of 40% of their time would have to be allocated to these projects and a minimum of 15% of their salary would have to been covered by those contracts. Sponsors will not pay that amount on a relatively small capstone project. Since the purpose of these small contracts is student learning, the University of Idaho VP of research was able to convince the Idaho State Board of Education to change the policy and allow capstone projects to fall under a faculty members' teaching time allocation rather than funded research.

The transparent, bottom-up process that was used to propose these recommendations has paid dividends in bringing about a number of positive changes with respect to outreach and engagement. At the University of Idaho, categories in position descriptions and annual evaluations were reduced

and simplified from ten to four, corresponding to the four areas specified in the institution's strategic plan (teaching/learning, scholarship and creative activity, outreach/engagement, and culture/climate). OEC members have collaborated with the Center for Service Learning to collect annual project vignettes and compile assessment data from student outreach for an annual service learning report that is used as the basis for successful submissions to the President's Higher Education Community Service Honor Roll. Three different outreach programs have won regional and national McGrath/Kellogg Awards given by the Association of Public Land-Grant University. The University of Idaho is currently working with capstone design faculty to prepare a submission for the 2014 competition.

The following agreements are the result of the cultural shift at the institution and more than two years of negotiations with large corporate benefactors/sponsors and a half-dozen contract iterations.

5.2 Master student educational activity agreement

The Master Student Educational Activity (MSEA) agreement [13] contains language intended to be mutually agreeable between the institution and industry sponsor. Recognizing the various needs and values of each entity, the MSEA establishes the purpose of the activity to be first and foremost educational and any resulting material outcome or student work product is supplementary. In addition to the signed MSEA, a statement of work or task order for each project is necessary to bind the institution and sponsor. The statement of work or task order outlines the specific project deliverables. The MSEA can be for a single year, but usually is a multi-year agreement between sponsor and institu-

tion. No individual project specific details are included nor agreed upon.

While it took significant effort to present to the Idaho State Board of Education the nature of capstone projects and that student learning is the desired outcome and not the creation of IP, eventually IP rights were allowed to be signed over to the sponsoring entity. IP is explicitly signed to the sponsor upon executing the MSEA. Any pre-existing IP of either entity does not change ownership nor are rights granted through the MSEA. Students and faculty are granted the rights to publish results of the sponsored activity, subject to review by the sponsor. In addition, confidential information held by either entity shall be protected from public disclosure.

A provision of the MSEA allows the institution to carry out fundamental research on information provided by the sponsor in compliance with the fundamental research exemption provided by EAR and ITAR. If information is restricted by export control laws, the sponsor must first notify the institution before providing the information.

Figure 1 illustrates the approximate time and major milestones required to secure an industry sponsor and execute an MSEA. Tasks are identified by faculty and institution.

5.3 Task order and budget agreement

The task order and budget agreement [14] is intended to obligate the institution and instructor to deliver the product of the anticipated activity. Sometimes the student team is identified and participates to some extent in scoping the anticipated activity. Other times the task order and budget are agreed upon prior to committing student teams to the project. The details of the task order are largely
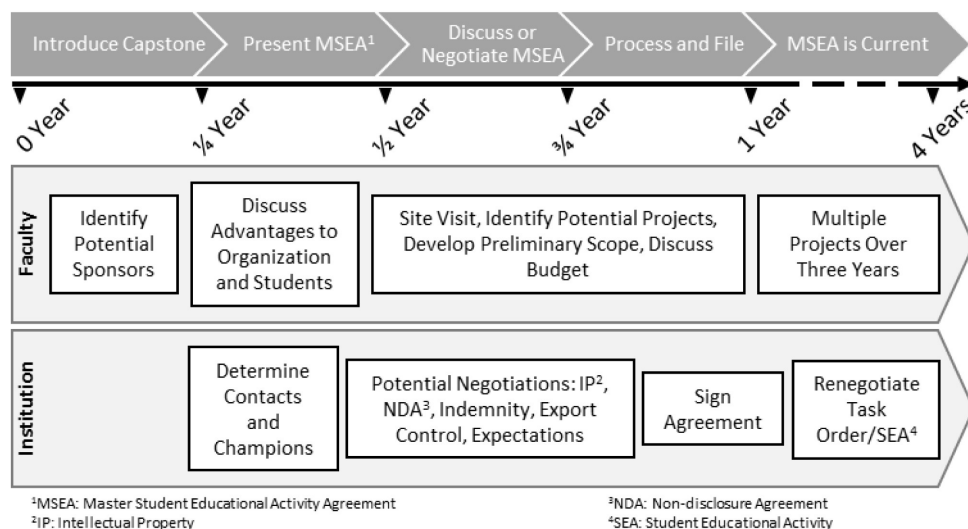

Fig. 1. Timeline of Milestones and Action Items for Establishing Contact and Negotiating a MSEA Agreement.

left to the sponsor and the student team to negotiate while the budget has already been agreed upon and reflects the anticipated results. An itemized budget is included in the task order and budget agreement with anticipated expenses identified such as travel, supplies, equipment, other direct costs and 5% overhead. Figure 2 shows a representative timeline and list of tasks necessary to formalize the task order and budget.

5.4 Student activity participation agreement

In addition to the MSEA and the task order, a separate Student Activity Participation Agreement (SAPA) [15] is provided, which holds students accountable for confidential information and surrenders rights to IP from the project to the sponsor. Prior to signing the SAPA, students are required to review an eight minute training video and pass an online quiz. The student is responsible for submitting IP disclosures and not infringing on any IP held by or licensed to the sponsor. Students are not

assigned to projects for which they are unwilling to transfer the potential IP generated during the project. Other internally-sponsored alternatives are always available. In practice, this restriction has not been a problem. In fact, students are often eager to work on projects that might involve IP development, and they understand and appreciate the fact that they can be inventors on IP but not owners. Figure 3 identifies the tasks and timeline required for executing the SAPA.

6. Case study: creating formal student activity agreements at California State University, Chico

The evolution to garner support and develop best practices at CSUC was perhaps less formal than at the UI. It evolved as a result of several pivotal events that exposed the short comings of a less than formal process for securing agreements with external sponsors on student educational activities.
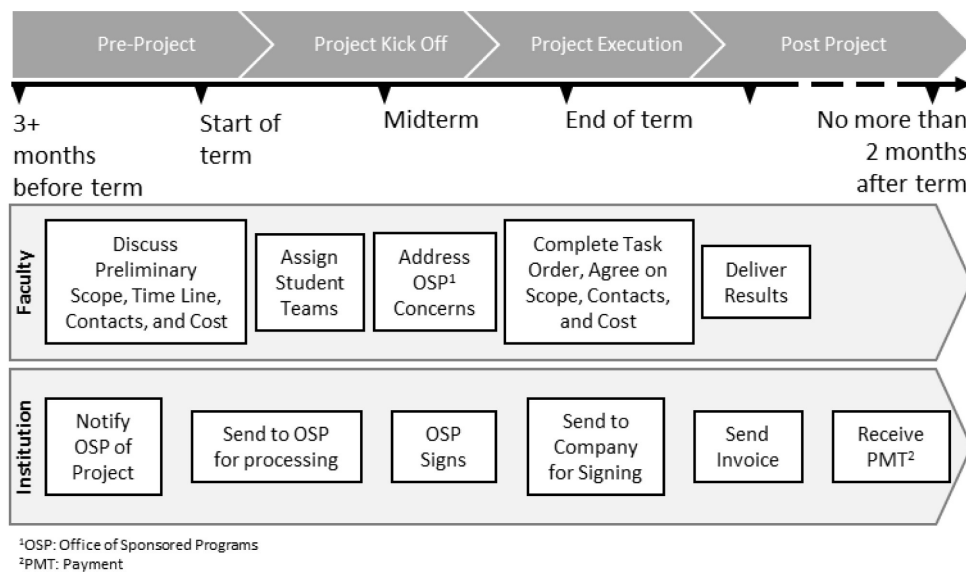

¹OSP: Office of Sponsored Programs
²PMT: Payment

Fig. 2. Task-order and Budget Timeline and Activities.

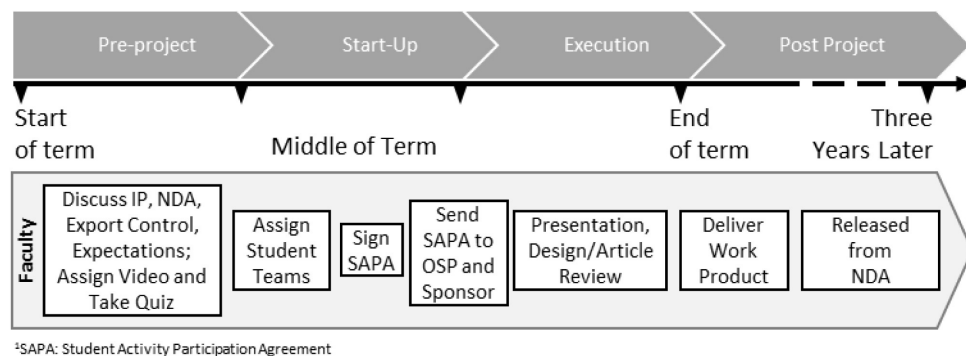¹SAPA: Student Activity Participation Agreement

Fig. 3. Timeline of Student Activity Participation Agreement.

6.1 Anecdotal evidence identifying the need for formal educational activity agreements

Like many programs across the country, the capstone design program at CSUC evolved from a senior projects class with little outside sponsorship to a formal multidisciplinary capstone design program with significant external sponsorship of projects. The transition did not happen overnight and many lessons were learned along the way. Two particular anecdotes from past years of the program illustrate the need for formal agreements and sound business practices.

An early external sponsor whose company specialized in assistive technology for the disabled was interested in a golf cart modification that would allow someone with below-the-waist paralysis to play the game. The device designed by the project team provided needed body support while allowing the golfer to move into position and swing the golf club. The project was developed by the design team in the absence of any IP agreement between the sponsor, students, and university. The project's outcome turned out to be a marketable product. The student team pursued a patent and considered forming a company to develop and sell the product. The sponsor felt that they had supplied the opportunity and had guided the team to the eventual design solution, and that the students should not own the design. The sponsor later requested presentation agendas and other documentation to demonstrate public disclosure of the design with the intent of declaring the technology in the public domain and therefore un-patentable. Despite full cooperation with the sponsor, and the current agreement structure that prevents similar outcomes in the future, the sponsor has never returned to the program.

In another case, a small local agricultural firm was interested in an automated material handling system for loading walnuts into trailers at harvest time. At the time, project funds were committed by the sponsor up front but were not collected until the funds were needed for fabrication and testing. After the project was well underway, but before the funds were received, the sponsor was cited for violating environmental regulations in an unrelated matter and was fined a substantial sum. The sponsor subsequently backed out of the financial commitment to the design project and left the team scrambling to fabricate and test their design without sufficient funding. Based on those and other experiences, the capstone design program at CSUC now relies on three basic agreements. There is a mandatory "Sponsor Agreement," an optional "Ownership and Non-disclosure Agreement," and a "Project Charter." The sponsor agreement is executed before the project is accepted into the class and is utilized for all projects sponsored by private sector entities. Projects from government agencies are treated as research projects and are managed through the university's office of sponsored programs. Ownership and non-disclosure agreements are executed if requested by the sponsoring company and are completed in the first few weeks of the semester after the student team has been assigned. Project Charter agreements are developed once project definition is complete, normally about five weeks into the first semester.

6.2 Sponsor agreement

The Sponsor Agreement [16] is a single page document that is based largely on similar agreements utilized at Brigham Young University. It is signed by representatives of the sponsor and the university. The primary elements of the sponsor agreement are:

- Sponsors retain ownership rights to all products, processes, IP, etc. generated during the course of the project.
- The university will take measures to protect confidential and proprietary information.
- The sponsorship fee is treated as a donation to the program and is exempt from overhead.
- The donation supports educational activities of students and is not given as *quid pro quo*.
- The program is educational in purpose and work is provided "as is" with no warranties expressed or implied.
- The sponsor and university indemnify each other against claims and liability.

6.3 Ownership and non-disclosure agreement

The Ownership and Non-disclosure Agreement [17] is a single page document that is based largely on similar agreements utilized at Brigham Young University. It is signed by each student on the design team as well as the faculty advisor. In this agreement, the students are generally agreeing to the following points:

- IP developed during the program is owned by the sponsor.
- Students agree to assign IP to the sponsor and cooperate in perfecting rights.
- Students agree to protect confidential and proprietary information for a period of five years.
- Students agree to return all records to the sponsor at the end of the project period.

6.4 Project charter

The Project Charter is a document that defines the scope of the project and is signed by all stakeholders (sponsor, team members, and faculty advisor). Projects are normally introduced to the class in a loosely defined state (intentionally). The first task of

the student design team is to define their problem; that is, to write a set of verifiable engineering specifications [18]. Once the specifications and outcomes have been agreed upon, the Project Charter is generated and signed. The primary content areas of the Project Charter include:

- Sponsor contact information
- Project start and end dates
- Project description
- Project scope (specifications)
- Project milestones and dates

Figure 4 illustrates the necessary steps and time required to implement all three agreements at CSUC.

Fig. 4. Timeline for Sponsor Agreement, Ownership and NDA, and Project Charter.

7. Conclusion

Focusing on the positive aspects of capstone design programs in particular, and service learning programs in general, is a wonderful source of university/industry and university/community partnership. These aspects are desired talking points by chairs, deans, and presidents. Concerns of institutional legal offices should be taken seriously, but they should be questioned to insure that revisionist interpretations do not make them overly taxing or complicated. The administrative paperwork associated with pursuing external projects should be as transparent and effective as possible and should help faculty recruit potential projects by alleviating natural concerns of prospective sponsors.

When revising the procedures and requirements of a current program or when creating new capstone programs, one should not have to endure the lengthy discussions, meetings, and negotiations that went into the MSEA, SAPA, and task order agreements at the UI and should not have to be motivated by the costs accrued by CSUC by not having agreements in place. The best practices discussed above and sponsor agreements accessed through website links in the references are intended to provide guidance and a head start to drafting externally sponsored capstone program agreements for one's own institution. Sufficient time and attention must be given to the process, and this time should be recognized as a valuable contribution to the overall mission and goals of the institution that supports service and experiential learning activities. While it is not possible to eliminate all risk from any activity, it is critical to properly identify the potential for risk, carefully and responsibly manage the execution of project outcomes, and have in place necessary agreements and acknowledgments that

appropriately and realistically support the program.

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