Introduction

Since 2001, Keck Graduate Institute of Applied Life Sciences (KGI) has conducted 140 projects for life science companies. One of the key reasons companies delegate such work to KGI is because they have more projects than people. They outsource an effort that would otherwise flounder or never happen.

Firms large and small – bio-pharmaceutical companies, medical device manufacturers, diagnostics entities, research tools firms, agricultural/industrial companies, health service organizations – have sponsored these projects, with 69% of all projects undertaken by repeat sponsors.

The efforts have varied in scope, ranging from wet lab investigations through competitive intelligence, engineering prototyping through M&A due diligence, database development through market assessment…and much more.

Known formally as Team Masters Projects (TMPs), these efforts are organized and executed by teams of three to six KGI graduate students. Joining the students as members of the extended team are a KGI faculty advisor and a representative of the sponsoring life science organization.

Each of the 140 teams has had its own personality, its own challenges, and its own triumphs. But from this rich experience come six key lessons on how to best optimize the combined intellectual firepower of industry and academia.

Lesson 1: Articulate Scope

To a greater or lesser extent, all 140 teams have struggled to define the scope of their work. Even our corporate partners have been challenged to distill their vision to words on paper.

What lesson have we learned to address this?

We have learned that it’s very helpful to ask each extended team member to articulate what he/she believes the scope to be.

One idea for accomplishing this could occur at project kickoff. Each team member – student, faculty advisor, corporate representa-
tive – writes down what he or she believes to be the three most important elements in the scope. Then these “threes” are cross-shared and discussed in order to separate critical scope elements from less critical (or even inaccurate) ones. A revised scope emerges from this, and the team again writes down the three most important elements from the revised version. This second set of “threes” is cross-shared and discussed. If necessary, a third scope version is produced. Involving everyone in stating and debating scope is a best practice teams use to form shared vision.

Lesson 2

Bridge the “Expectations Gap”

Despite our progress on ensuring scope understanding, we have learned that scope is not enough. Almost as important is bridging the expectations gap.

What’s that? It’s the process gap that exists between the industrial and academic sides of the team. While scope deals with the “what” of projects, expectations deal with the “how”. Expectations disconnects can undercut efficient operation of the extended team.

What are examples of expectations gaps? For one, students and even some faculty members are unfamiliar with business processes – organizing, problem-solving, scheduling, decision-making, managing, evaluating, prioritizing, and more.

But corporate liaisons are so ingrained in business processes that they do not consider checking with their academic counterparts regarding how “business” is “run”. For example, it may be second nature for an industry representative to multi-task a problem…whereas a student might think much more linearly about the issue.

In like fashion, students and faculty have expectations about their corporate counterpart that also should be made explicit. They may, for instance, expect the primary company representative to identify a backup who can pitch in when the primary is traveling. But without realizing this, the industry liaison could simply assume that the team will continue to work even if a weekly conference call is missed.

Without checking each others’ expectations, both the academic and industrial components will play much catch-up to close the gaps in business processes.

Even the best-run companies may not have documented – or elect to share – their policies and procedures. So we attempt to bridge that gap with our own expectations checklist shown below.

<table>
<thead>
<tr>
<th>Topic</th>
<th>What does the company expect?</th>
<th>What do the students expect?</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Team charter</strong></td>
<td>The company expects a team charter to be created – yes or no? If yes, what contents?</td>
<td>The team expects to create a team charter – yes or no? If yes, will the company need to ‘bless’ the charter, or is it for student use only?</td>
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<tr>
<td>Topic</td>
<td>What does the company expect?</td>
<td>What do the students expect?</td>
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<tr>
<td>Communications</td>
<td>How much detail in each of weekly conference calls, presentations, updates, etc.?</td>
<td>Identify a backup company representative to handle communications if primary liaison unavailable.</td>
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<td></td>
<td>How should bad news be communicated?</td>
<td>Determine who should deliver bad news – team, faculty advisor, both?</td>
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<tr>
<td>Meeting and conference calls</td>
<td>Who will conduct them?</td>
<td>Will meeting facilitator rotate on a regular basis?</td>
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<td></td>
<td>How far in advance should agendas be distributed?</td>
<td>How long should agendas and minutes be kept in the electronic team room?</td>
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<tr>
<td></td>
<td>What are suitable agenda topics?</td>
<td></td>
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<tr>
<td></td>
<td>When are minutes due?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>What format should agendas and minutes follow?</td>
<td></td>
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<td></td>
<td>Who ensures that follow-ups are done?</td>
<td></td>
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<tr>
<td>Presentations</td>
<td>Given confidentiality issues, what materials will require company review? How far in advance for company review?</td>
<td>Are all team members expected to present – or will a subset suffice?</td>
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<tr>
<td></td>
<td>How long will it take to gain approval?</td>
<td></td>
</tr>
<tr>
<td>Activities</td>
<td>What are the action steps the team is expected to undertake?</td>
<td>Will the company state what its required actions are – or should the team take the lead on designing tactics?</td>
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<td></td>
<td>For example, what experimental details will team conduct, what will company provide?</td>
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<td></td>
<td>For another example, if team is interviewing KOLs, will team members be expected to obtain contacts, or will company provide?</td>
<td></td>
</tr>
<tr>
<td>Change control</td>
<td>What is expected of the team?</td>
<td>Company should explain whether it desires broad or narrow change control.</td>
</tr>
<tr>
<td>Innovation</td>
<td>What is expected of the team?</td>
<td>How far will company allow the team to wander in pursuit of innovation?</td>
</tr>
<tr>
<td></td>
<td>A lot of innovation…a little…something in between?</td>
<td></td>
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</tbody>
</table>
Lesson 3: Never Underestimate the Power of a Deadline

Across the globe, lots of excellent research is conducted in academic labs in concert with industry. For the most part, this is open ended work, hewing to the notion that “you can’t schedule discovery.”

While this may be acceptable for traditional industry/academic collaborations, it is impractical for TMP teams.

All our projects are time bound, usually from September through May (or, even more intensely, for one semester). Final and interim deadlines are the gears that enable the project engines to consistently fire. Companies know when they can expect “the answer.”

For example, a route of administration project was structured to accommodate in vitro lab research of three options in the fall, with a final technical recommendation due in December. This was followed by market research to confirm the market opportunity represented by the selected tech recommendation – due in March. For May, a comprehensive technical/business report was due.

KGI builds overall TMP operation – including project recruitment – around deadlines. The clearer the due dates and corresponding deliverables, the better organized teams can be. Rather than inhibiting creativity, organization enables extended teams to be more creative.

Lesson 4: Learn How to Fight Productively

To fight productively, students, faculty, and corporate liaisons must be willing to disagree with each other -- and to justify their positions.

How do teams learn to do that?

The first step is to foster a sense of confidence that opposing opinions are not only tolerated, but encouraged. Bright students – otherwise outspoken in class – often clam up rather than express a viewpoint at odds with that of the corporate liaison. On the corporate side, the representative may believe that the faculty advisor is a subject matter expert not to be challenged. Finally, said faculty member may not feel comfortable disagreeing with someone from industry.

Second, a topic must be well analyzed to enable a variety of perspectives to emerge. This requires more than superficial bouncing off the subject’s hard carapace. It requires

Confidence is one of the most distinctive traits of high-performing teams. When students are confident about each other, they tend to more readily focus on project demands rather than intra-team dynamics. If faculty advisors are confident about their relationships with their corporate counterparts, they are more likely to engage in candid conversations about team backstories. And company liaisons confident about their academic partners frequently foster more original problem-solving.

Ample early interaction among members of the extended team can generate confidence. Effective groups build extra hours for interaction at the project start. These interactions may be informal (e.g., team-building outings such as sporting event attendance) or formal (e.g., leadership exercises). Another effective technique is to scenario plan possible routes the project could take and visualize how each team member might respond.
the strenuous effort of pulling the topic apart, closely examining each component, and determining if and how that component impacts the topic at hand.

For example, a project is charged with conducting a pharmacoconomics study of the lifetime cost of a rare disease. This might have consisted of identification and summation of direct and indirect medical costs, and no more.

Far more sophisticated would be to pull apart the lifetime experience of a patient with that rare disorder, and then to analyze these broader life cycle experiences, considering opportunity costs, employment, family burden, and other. With all these elements broken out, the team could then argue (with justification) over what elements should ultimately make their way to the pharmacoeconomic study.

Such “fights” indicate that differing points of view have been aired. Airing differing viewpoints suggests that a topic has been sufficiently analyzed to support several interpretations. And many interpretations typically reflect meaningful team accomplishment.

**Lesson 5** Spend Time Thinking Negatively

**Risk Management**

Managing risk tends to be non-intuitive in industry/academic team collaborations.

Often, students assume that a project will proceed in a linear fashion, never appreciating the myriad of backward loops and dead ends that shape the life cycle of most work.

On the company side there tends to be a perception that because “academics” are handling a project, they will be as correct as if they were delivering a class lecture. Both are counter-productive to effective industry/academic teams.

Outstanding teams tend to spend time thinking negatively. They contemplate what can go wrong with the resources, the scope, the schedule, the work product, the externalities. And not just what can “go wrong,” but what can become spectacularly flawed.

After brainstorming internal and external risks and uncertainties, teams use various risk matrices to prioritize them in terms of likelihood and severity. These matrices should then be incorporated into the project plan.

**Skin in the Game**

Another type of negative thinking concerns the risk borne by each team member for unsatisfactory project performance. High performing teams can attempt to lever the interdependencies caused by all parties’ “skin in the game.”

Rewards-driven collaborations – for example, milestone payments – are common in the life
Managing on the downside can be extremely effective – especially when all extended team members are aware of what’s at stake.

For students, grades and graduation are at stake. Faculty advisors are at risk for performance assessments. And corporate representatives are on the hook if the project is unsuccessful. (Not to mention the reputation and pipeline risk KGI faces for unsatisfactory project performance.)

While it may seem obvious that all parties are aware of the others’ risks, it’s not. And if it’s not obvious, it’s not actionable.

That’s why a best practice is to engage the extended team in frank conversation about both the upside reward (e.g., graduation, promotion) and downside risk faced by each team member.

For example, students need to internalize the reality that industry feedback can have a bearing on their grade. Trite as it may sound, grade input can have a large motivational impact on completing quality work on schedule.

Corresponding to this, company representatives need to be encouraged to provide candid grade feedback. Otherwise, even the boldest industry leader may tend to become a bit squeamish when it comes to offering curricular evaluations.

**Lesson 6**

Develop Policies and Procedures that Incorporate Best Practices

It’s a much-overlooked tool of project management, but logging lessons learned and using them to improve performance is invaluable.

Traditional industry/academic collaborations – usually around R&D – sometimes may be conceptualized as “one offs”. That is, the university principal investigator may undertake basic research for the company, but once the grant or contract has expired, the parties go their separate ways.

The KGI model is continuous – not necessarily involving the same students, faculty members, and corporate liaisons every year, of course. But the TMP life cycle repeats on an annual basis. This provides us with the tremendous advantage of gathering and analyzing lessons learned at the end of each project cycle. Then these lessons – such as the six summarized here – can be used to improve our strategies and tactics.

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