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LEE FLEMING

SpudSpy

Professor Larry Cohen stared at his speakerphone in stunned silence. On the other end of the line was Margaret Lipton, the dean of the university's E.L. Shahan School of Business. The dean had just informed Cohen that some of his MBA students were being threatened with legal action for their role in what the dean described as "a fraudulent start-up, a shell game." Cohen knew the students well. In fact, they were among the brightest and most personable students in his MBA 710b course entitled "The Entrepreneurial Venture." Cohen found it hard to believe that the students had done what the dean was accusing them of.

Cohen snapped out of his silence and responded: "Margaret, I'll get to the bottom of this right away."

"You'd better, Larry. They are threatening to file a restraining order by close of business tomorrow. If the university's Office of General Counsel gets involved, it is going to make our lives *much* more difficult. I don't need to tell you how important it is that this be resolved immediately."

Cohen knew what Lipton meant. The Shahan School, consistently a top 10 player in the rankings, was deeply committed to two Lipton-led initiatives that could be affected by this impending crisis. First, in the wake of the corporate fraud cases that had rocked U.S. industry in the past five years, many business schools had developed required courses on ethics. At Shahan, this set of courses had come to be particularly well regarded and was considered a source of differentiation in the magazine rankings of business schools. Second, at the request of the university president, Lipton had established a center at the business school charged with promoting the commercialization of innovations originating elsewhere within the university. Cohen had been tapped to administer this center, called the Technology Center, two years before. The students in question had been working on a business plan to commercialize an innovation that originated in the university's College of Engineering.

MBA 710b: The Entrepreneurial Venture

The university's Graduate School of Business had changed its name to the Shahan School of Business in 1983 following a gift of \$36 million by a wealthy entrepreneur named E.L. Shahan. Shahan's gift had helped fund, among other projects, a new building to house the school. Among Shahan's wishes was that a strong emphasis be placed on curriculum related to entrepreneurship. In

Professors Daniel Snow and Lee Fleming prepared this case. The university mentioned in this case is fictional. While Exhibits 1-3 come from Harvard University, they are used only as examples of similar policies at U.S. universities. HBS cases are developed solely as the basis for class discussion. Cases are not intended to serve as endorsements, sources of primary data, or illustrations of effective or ineffective management.

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response to this, a set of entrepreneurship courses was developed for MBA students. One of these courses, MBA 710b, was taught by Cohen and was designed around the formulation of business plans by teams of MBAs. Some of the business plans written in the course had gone on to win seed money from investors, and at least one had spawned a company that was now listed on the NASDAQ after a highly successful “post-bubble” initial public offering.

At the start of each semester in which 710b was offered, Cohen divided the class of 60 into teams of between three and five students. About half of the teams constructed business plans around ideas that a team member had brought into the class, and about half chose ideas from Cohen’s “idea database.”

During the course of the semester the teams developed business plans, starting with five-minute presentations of their idea and culminating in a closed-door, nondisclosure agreement-protected final presentation attended by Cohen and successful alumni, some of whom ran venture capital firms.

Technology Commercialization at the University

The university had claim on technologies invented by people affiliated with its engineering and science schools (for representative legal documents, see **Exhibits 1** through **3**). The university’s Technology Commercialization Office, or TCO, was charged with tracking, protecting (patenting), and commercializing university-owned inventions. Only a small percentage of university inventions were ever successfully sold or licensed. However, the five most productive inventions had produced more than \$50 million for the university over the previous 15 years. The university passed along 35% of these proceeds (royalties and outright sales) from inventions to the inventors, usually professors and graduate students.

Most technologies owned by the university were never commercialized because they fell into one of two categories: Either the TCO did not deem them valuable enough to market, or the TCO had tried to market them but had been unsuccessful in doing so. Cohen’s idea database was populated by a variety of inventions, many of which came from the TCO’s list of university owned inventions. Some of those had been evaluated by the TCO but had been deemed less worthy of case officer attention. Cohen used his contacts in other campus departments to identify additional appropriate inventions. Sometimes these contacts attempted to work through the TCO, but personnel churn and various problems at the office had prevented effective commercialization of many such inventions.

Because the TCO took steps to commercialize only 3% of the university’s technology disclosures and because most professors were reluctant to commercialize inventions themselves, there were a great many technologies on campus that would never be commercialized. Cohen believed that there was value in the campus technologies that the TCO had chosen to ignore, and it was with these ignored innovations that he primarily populated his idea database.

The Technology

During the 1980s and 1990s, U.S. government intelligence and law enforcement agencies began to use remote sensing technologies to provide data on agricultural activities in remote locations. The category of remote sensing was a broad one, encompassing standard photography, infrared photography, active radar scanning, and more exotic technologies such as spectral signature analysis. For example, the U.S. Drug Enforcement Agency (DEA) used satellite and aircraft-based remote sensing to identify coca fields in Latin America and thereby to direct drug interdiction efforts. Non-

law-enforcement uses included efforts to track and predict a fast-moving fungus that threatened the \$18 billion U.S. soybean crop.¹ Government agencies were active participants in the research and development process, spending significant amounts of money on remote sensing research at universities. A recipient of one such grant was Professor Robert Anderson of the university's College of Engineering.

Anderson was a very well-respected solid-state physicist. Only in his early 40s, Anderson had already developed a widespread reputation for careful and thoughtful work. His collaborators often teased him about his attention to detail, and while they sometimes found his attitudes a little intense, they always appreciated his willingness to step up and complete the work without cutting corners. His creative pride and dedication to his research was obvious to everyone. Anderson's dissertation and early research had been theoretical, but as his career progressed, he found himself directing experiments and conducting empirical validation of his predictions. Indeed, it was the possibility of confirming his theoretical predictions that led him to leave another university's physics department for his current position in the engineering school.

Under the agency grant, Anderson and one of his graduate students, Catherine Huang, had developed a chip that permitted observation of nonvisible light frequencies. Clever processing of the signals generated by this device made possible the remote identification of plants—their species and their stage of maturity. The funding agency's grant provided for contingency funds to mount the device on a small plane for real-world tests if static tests proved successful. It was clear that the agency's ultimate goal was to mount a device incorporating their technology on an airplane, a remotely operated vehicle, or even a satellite.

Huang's dissertation had developed around an anomaly she noticed while testing the prototype. During one test session, while adjusting the operating parameters of the sensing equipment, she noticed a difference in the data being generated. Further inspection revealed that the equipment could infer attributes, not just of plants, but also of the ground around the plants. Under the guidance of Anderson, she developed the technology so that it was reliably able to remotely infer the pH value of soil. Johnson and Huang thought the agency would be excited by Huang's innovation because one of the most important determinants of agricultural productivity was soil pH value. And although this was well-known to farmers, soil alkalinity was something that had heretofore required sample testing. Anderson and Huang felt they were offering the agency the ability to analyze and forecast agricultural productivity without having to visit the farm of interest. They had gone so far as to test the prototype in a flight over a plot of land managed by a plant genetics team at the university. The funding agency was more interested, however, in the capability of the technology to remotely identify plants and, after brief consideration of remote pH sensing, Anderson was told that the agency did not wish to pursue the application.

All was not lost, however, as the pH-sensing portion of the technology became Huang's dissertation. After graduation, she took a job with a private firm that specialized in signal processing, but that had little to do with the technology she had developed as part of her dissertation research. Huang remained active in academic research and publishing, often collaborating with her mentor, Anderson.

Two years and three TCO case officers later, the technology still sat on the shelf in Anderson's lab. At that time, Anderson's department chair returned from an administrative meeting with the engineering college's dean, James Camden. Camden had asked the chair to survey the faculty for promising technologies to include in a list that the college wanted for a business plan course at the

¹ "Plant Pathologists Gear Up for Battle With Dread Fungus," *Science*, Vol. 306, December 3, 2004, pp. 1672–1673.

business school. Anderson expressed disdain for the possibility, saying that he was a scientist, not a businessman. The department chair pressed Anderson, however, saying that it was easier to get funding for the school, from both government and industrial sources, if the school could demonstrate successful commercialization projects. Anderson offered up the sensing technology because he believed that, since it was already published in peer-reviewed journals, he could simply refer the business students to the appropriate articles. The disclosure had been patented as well, though the patent was weak, since Anderson had been unaware of the importance of disclosure prior to publication. Anderson thought that Huang could also deal with any inquiries. Indeed, she had briefly tried to start a firm around the technologies. Anderson thought that Huang was extremely bright and had been surprised when she chose an industrial career.

SpudSpy

The pH sensing technology was on the list of possible project ideas Cohen passed around during the third week of class in March of 2004. Two second-year MBA students, Thad Simcoe and Avi Rothman, noticed the pH sensing technology immediately. Although Simcoe and Rothman had not known each other before entering the Shahan School as MBA candidates, they had become fast friends as a result of a common background—both had grown up on potato farms, Simcoe in Idaho and Rothman in Israel. Although neither was interested in becoming a farmer himself (they both hoped to start and build their own firms), both recognized the value of technology to the modern farmer. Indeed, the previous 10 years had seen large advances in potato farming, from global positioning system (GPS)-guided tractors to new disease-resistant potato varieties.

One persistent challenge potato farmers in arid climates faced was the issue of soil alkalinity. Over time, irrigated land accumulated alkaline minerals left by irrigation water as it evaporated. After many years of irrigation, a plot of farmland would become increasingly less productive if the alkalinity was not addressed appropriately. One method for treating this was to let fields “lay fallow”² or to rotate crops, two choices that adversely affected potato productivity. As an alternative to these options, some potato farmers had begun to treat fields with organic acids to neutralize the soil’s accumulated alkalinity. However, this job was made difficult by the fact that alkalinity could vary widely from one place to another within the same field, depending upon water-drainage patterns.

Simcoe and Rothman felt that the pH sensing technology could be a boon to potato farmers who irrigated their fields. In recent years, GPS technology and increasingly powerful computers had given farmers access to unprecedented levels of information about their crops and fields. For instance, one system combined harvest-mounted sensors and GPS receivers to give farmers a detailed productivity map of their fields. Simcoe and Rothman felt that the pH sensing technology would, in the vernacular of the business school, “address the potato farmers’ pain” and that it fit nicely with technologies already being used by many farmers. On this basis, they asked Cohen if they could build their business plan around commercializing the pH sensing technology. No other team had expressed interest in the technology, so he agreed. He did ask, however, that two other students who had not found a project be included in order to round out the assignments. Simcoe and Rothman expressed disappointment at the prospect of working with the two students (who were not known for their team efforts) but did not feel as if they could argue the issue. At the bar a few weeks later to celebrate St. Patrick’s Day, Simcoe and Rothman came up with a name for their new business, “SpudSpy,” a

² The practice of letting a field become overgrown with native plants for a period of time in order to reestablish appropriate balance of nutrients in the soil.

name they felt combined potatoes (spuds) with the original purpose for which the technology had been developed.

The Business Plan

Simcoe and Rothman managed to track Anderson down later that week. They met in Anderson's office and brought an agenda they hoped to follow during the meeting. The agenda contained a list of issues they wanted to cover so that they would have a better idea of how to proceed with SpudSpy. During the course of the meeting, however, it became clear that Anderson was not terribly interested in the project. Rather, Anderson preferred to talk about physics that Simcoe and Rothman could not follow and to complain about his recent lack of experimental results. He also groused about colleagues he knew whose hard work had been exploited by "business types."

When the discussion finally came around to the pH sensing technology, Simcoe and Rothman were surprised when Anderson shared with them what he thought was a promising application for the technology, "analysis of farmers' fields in dry climates—things like cotton, maize, and potatoes. We never pursued it, however, not much interesting physics there." Although Anderson and Huang had not mentioned this application in the articles they had written about the technology, Anderson thought that pH analysis might be helpful to poor farmers in developing countries. Rothman told Anderson that he and Simcoe had thought of something very similar, but Anderson dismissed their idea with, "Well, yes, that is one application." In fact, Simcoe and Rothman left the meeting feeling as if Anderson had heard little of what they had said. They decided that the best strategy would be to start developing the business plan so that they would have something more concrete to present to Anderson. Perhaps if he saw that the technology really could help struggling farmers in First and Third World countries, he would be interested in helping.

Over the next few days, Simcoe and Rothman debated how best to commercialize the SpudSpy technology. They tried to include the additional students in the project, but scheduling conflicts made it very difficult to meet. They settled on a consulting model, by which farmers paid them to analyze their fields, over a sales model, by which they sold the remote sensing hardware. They reasoned that because the technology was in its infancy, it would likely change very quickly. This would make hardware sales difficult. Furthermore, they were concerned that they would be unable to protect the intellectual property embedded in SpudSpy if customers owned the actual equipment. They agreed on the need to pursue a patent before going to a sales model. Although neither Simcoe nor Rothman had a legal background, Simcoe had a patent attorney friend who assured him that the original patent was "completely full of holes," such that it would be no problem to carve out the specific SpudSpy application. The friend volunteered to prepare the application in return for a small portion of the returns.

As they did the analysis for their business plan, it became clear that they required outside funding to achieve the growth they hoped for. Construction of a number of SpudSpy devices, leasing of small airplanes on which to mount them, and personnel expenses added up quickly. Simcoe and Rothman projected that they would need \$750,000 to make it through the first 18 months. Given these large expenses, it was clear that SpudSpy would need to be funded by a venture capital (VC) firm or by an angel investor. Rothman and Simcoe thought that funding was possible, based on a conversation with a local VC firm at a Shahan recruiting event.

They gathered again at their favorite watering hole on the afternoon of Friday, March 26. Unknown to Simcoe and Rothman, their entrepreneurial aspirations had initiated a sequence of events that was about to spin out of control. In particular, a series of seemingly innocuous e-mails

(**Exhibit 4**) was about to generate a sequence of difficult exchanges (**Exhibit 5**). By the end of the next week, Simcoe and Rothman no longer controlled their project. The decision to proceed—if indeed it were possible to proceed given the attitudes and loss of good will—rested with Cohen.

Decision Time

Cohen pondered his options, knowing that he was facing a working weekend (see the timeline in **Exhibit 6**). First, he could attempt to salvage the project. Given the broad interest it had generated and the possibility of new funding for the engineering school (see **Exhibit 5**), it could be the program's greatest success to date. If he pursued this option, he would need to sort out the tangled perceptions of problems, ownership, credit, and growing interest in the technology. Alternatively, he could simply shut everything down and implement damage control. Finally, he wondered what safeguards he needed to develop to avoid this in future classes. He asked the students and Anderson to forward all communication on the project so that he could reconstruct the chain of events.

Exhibit 1 Representative Intellectual Property Participation Agreement for a Major U.S. University^a

Harvard University Participation Agreement

Introduction

The President and Fellows of Harvard College adopted, on March 17, 1986, an amended "Statement of Policy in Regard to Inventions, Patents and Copyrights." This Policy, as amended from time to time, applies to all members of the University, and in particular to anyone who participates in externally sponsored programs. Also, Federal policy requires the University to obtain written agreements from professional staff members of Federally sponsored programs regarding their obligations for reporting and assignment of inventions.

Agreement

In order that the University may carry out its obligations, and in consideration of my present or subsequent employment by the University or the availability to me of opportunities to perform sponsored research or use funds or facilities administered by the University, I hereby agree as follows:

1. I have read, and I understand and agree to be bound by the terms of the "Statement of Policy in Regard to Inventions, Patents and Copyrights," a copy of which is attached to this Agreement, as well as by the terms of any revisions or amendments adopted by my Faculty and/or the President and Fellows of Harvard College.
2. In particular, I agree to report promptly to the Office of Patents, Copyrights and Licensing any invention or discovery conceived or first reduced to practice as part of or related to my University activities, and to assign or confirm in writing to Harvard all rights to any such invention or discovery if that is required by Harvard's obligations to external sponsors of research or by Harvard policy.
3. I understand that Harvard sometimes accepts obligations under the terms of agreements which are binding on those participating in externally sponsored programs. Therefore, if I am associated with such a program, I understand that it is my responsibility to ascertain the terms of such agreements as they relate to me. I agree to do so and to abide by all applicable terms of such agreements.
4. I also understand that there may be instances where University policy or Harvard's obligations to external sponsors may preclude my being able to retain copyright and I agree in such cases to assign all rights to Harvard or its designee. I further understand that, in its agreements with external sponsors, Harvard seeks to retain maximum publication rights for its members and itself.
5. I will cooperate fully, at no expense to me, with the University or its designee in the evaluation and prosecution of patents, in the registration of copyrights and in the preparation and execution of all documents necessary or incidental thereto.
6. In addition, I understand and accept the provisions of the University's royalty income sharing policy dated August 1, 1979, revised in September 1984, and as amended from time to time.

7. I am now under no obligation to any person, organization or corporation with respect to any rights in inventions, discoveries or copyrightable materials which are, or could reasonably be construed to be, in conflict with this Agreement.
8. I recognize that this Agreement is part of the terms of my appointment at Harvard and that its obligations in regard to my activities while holding a Harvard appointment shall continue after termination of my Harvard appointment.
9. Finally, this agreement shall apply to all copyrightable materials created, and to all inventions made, conceived or first actually reduced to practice after the date this Agreement is signed, and shall be binding on myself, my estate, heirs and assigns.

Signed: []

Name: []

Date: []

Source: Harvard University.

^aWhile this agreement comes from Harvard University, it is used only as a representative note of similar agreements at U.S. universities. Source: <http://www.techtransfer.harvard.edu/ParticipationAgree.html>, accessed on Feb.16, 2005.

Exhibit 2 Representative Excerpts from an Invention, Patent, and Copyright Policy for a Major U.S. University^a

Harvard University Statement of Policy in Regard to Inventions, Patents, and Copyrights

Introduction

Concern for the public interest in potential new products and processes resulting from discoveries or inventions made by members of the University in connection with and related to their University activities, and the growing application and use of communications media, educational technology, and computer programs in the work of the University, raise new and complex problems relating to the proper and equitable distribution of rewards and obligations. The production of such materials may involve the inventors or authors, the University, and outside sponsors. The situation is further complicated by evolving Federal policy and legislation in the area of both copyrights and patents. All of these considerations made it desirable for the University to reconsider its past policies in this area, and to develop and reduce to writing a policy which will be understandable to members of the Harvard community, and which will provide the basis for equitable adjudication between the various interests involved.

Since activities in the University are too diverse and are evolving too rapidly to permit a statement of a University-wide general policy which can be mechanically and unambiguously applied to every possible situation that might arise, it is felt necessary for detailed policy to evolve by the making of decisions on individual cases based on interpretation of the general policy and principles enunciated below.

The following principles govern the development and application of the University's policy for inventions (including certain tangible results of research, such as biological materials, devices, and certain software), patents, and copyrights.

First, the policy should encourage the notion that ideas or creative works produced at the University should be used for the greatest possible public benefit. This would normally mean the widest possible dissemination and use of such ideas or materials. Thus, every reasonable incentive should be provided for the dissemination into use of ideas, and the production and introduction into use of creative works or educational materials generated within the Harvard community. While this policy places benefit to the public before financial gain, it recognizes that it is also appropriate and desirable for the University and individual inventors or authors to benefit financially from the sale of products based on their inventions or other creative works. In deciding how to proceed in regard to a particular invention or creative work, the University will consider the benefits and consequences for the public and the University, as well as the individual inventors or authors.

Second, the policy should protect the traditional rights of scholars with respect to the products of their intellectual endeavors. For example, the policy should not interfere with the right of a scholar to decide to publish a book or an article and, if so, when and under what circumstances. With respect to works in which the University takes ownership or has any form of control, the person(s) who created the intellectual property shall be consulted in the determination of how it is to be made public, developed, modified, and/or commercialized.

Third, when University support makes the enterprise possible or when it provides extra or special support, either with money, facilities, equipment, or staff, for the development of ideas or the production of works, it is reasonable for the University to participate in the fruits of the enterprise and/or to be reimbursed for the University's extra or special costs, if such ideas or works are introduced commercially.

The following general policy is applicable to all members of the University, including students, in connection with their University work.

Inventions and Patents

1. A member of the University is expected to notify and to disclose to the University in a manner stipulated by the Committee on Patents and Copyrights (the "Committee") any discovery or invention the individual has made and has reason to believe might be useful, patentable, or otherwise protectable, including potentially useful biological materials, devices, and certain software, even if not patentable ("Inventions").

Except in cases of Inventions primarily concerned with medical diagnostics/therapeutics or public health—such determinations to be made in each case by the Committee—an individual may elect to pursue the patenting and/or commercial introduction of potential Inventions without assistance from the University.

The University must be notified of such election and the individual's plans must be briefly described in writing at the time of disclosure. The inventor then shall have the right to pursue the patenting or commercial introduction of the Invention, subject to the diligent prosecution of same. (The University may require a showing from time to time that the Invention is indeed being pursued. If the University is convinced that the inventor is not diligently pursuing the introduction of the Invention into public use, it may require submission of a further disclosure in a form prescribed by it for processing by the University.) An individual who obtains a patent or introduces an Invention into public use without assistance from the University, and without substantial University involvement as described in Section 4 below, shall be entitled to all royalties or other income resulting therefrom. It is expected that in pursuing the introduction of an Invention into public use, individuals will make arrangements that best serve the public interest, and the Committee will be available to advise individuals on this question.

2. If a member of the University elects not to pursue or fails to pursue a patent and/or the introduction of an Invention into public use, and in any case arising in regard to Inventions primarily concerned with medical diagnostics/therapeutics or the public health, the University has the sole right to determine whether title shall vest in the University. If title is to vest in the University, the University shall have the right, either directly or through an outside agent, to evaluate and seek patent or other protection of the Invention, and to undertake efforts to introduce the Invention into public use. The individual is then expected to cooperate in every necessary way (but at no expense to the individual) with the University and/or the outside agent, including assigning to the University any ownership rights the individual may have in order to permit the University or the outside agent to evaluate the Invention, to seek a patent, and/or otherwise to introduce the Invention into public use. Royalties or other income resulting from the Invention will be shared among the inventor, the University and the outside agent (if any) in accordance with the University's policy and any relevant terms of any agreement between the agent and the University. The University's arrangements with an outside agent and/or a licensee for handling Inventions should reflect the importance of serving the public interest in these matters.

3. Notwithstanding paragraphs 1 and 2, whenever research or a related activity is subject to an agreement between an external sponsor and the University that contains restrictions as to disposition of Inventions, any such Inventions shall be handled in accordance with such agreement. As at present, all participants in externally sponsored research will continue to be required to accept the

conditions in the agreement between the University and the sponsor before being permitted to participate in the sponsored research. In negotiating with sponsors, project directors and other representatives of the University should strive to advance and protect the public interest as well as to obtain the greatest latitude and rights for the individual inventor and the University consistent with the public interest and this policy.

Copyright

4. Except as qualified below, a member of the University is entitled to ownership of copyright and royalties or other income derived from works.

5. Notwithstanding paragraph 4, whenever research or a related activity is subject to an agreement between a sponsor and the University that contains restrictions concerning copyright or the use of copyrighted materials, all materials shall be handled in accordance with such agreement.

6. Notwithstanding paragraph 4, whenever a copyrightable work is created by a member of the non-teaching staff as part of the individual's University responsibilities, the work shall be treated as a work-for-hire under the terms of the Copyright Act of 1976, and ownership will ordinarily be retained by the University.

General Provisions (applicable to Inventions, Patents, and Copyrights)

7. In circumstances in which there is substantial University involvement in the creation of an intellectual product, the foregoing provisions concerning rights to obtain a patent or copyright or the rights to royalties or other income, or both, may be varied in favor of the University by explicit agreement between the creator(s) and the University. These circumstances include:

- a. substantial University financial, staff, or other assistance;
- b. extensive use of special or rare University holdings, such as museum collections;
- c. significant use of voice or image of students or staff in a product, or substantial creative contribution by staff or students to the preparation of the product; or
- d. use of the name or insignia of the University or any of its units (other than for purposes of identification of individual faculty members) to identify or to promote the distribution of a product, or other identification or promotion that implies the approval or endorsement by the University or one of its units.

8. When the responsible Dean (in the case of Schools) or administrative director (in the case of independent units) determines that any of the circumstances described in Section 7 obtain, the individual creator(s) shall enter into an explicit agreement with the University.

- a. The Dean or administrative director normally concludes the agreement with the creator(s) on behalf of the University, in consultation with the Office for Technology and Trademark Licensing. The Director of the Office for Technology and Trademark Licensing shall report such agreements to the Committee on Patents and Copyrights.
- b. Any such agreement should protect the appropriate ownership rights of the creator(s) and establish the University's share of any royalties or other income derived from the product. For Inventions or copyrightable works to which the University has taken title, royalties or other income shall be allocated in accordance with Appendix A. For all other works, allocation of the creator(s)' share of royalties or other income shall be determined by agreement between the creator(s) and the Dean or administrative director, and allocation of the President and

Fellows' share shall be determined by agreement between the Provost and the Dean or administrative director. In all cases covered by the preceding sentence, the schedule in Appendix A shall normally govern unless the parties agree on a different allocation within a reasonable time. Any such agreement shall also assure the University's right to use the product in its own non-profit educational activities on a royalty-free or reduced-royalty basis. In the case of copyrightable products that do not bear Harvard's name or insignia in the title, the creator(s) shall normally retain ownership.

Source: Harvard University.

^aWhile this agreement comes from Harvard University, it is used only as a representative note of similar agreements at U.S. universities. Source: <http://www.techtransfer.harvard.edu/PatentPolicy.html>, accessed on Feb.16, 2005.

Exhibit 3 Representative Royalty Sharing Policy for a Major U.S. University^a

Harvard University Supplement to the Royalty Sharing Policy for Intellectual Property

*Adopted by the University Committee on Patents and Copyrights, January 19, 2001
and amended March 2003.*

Usual Distribution Methods for License Income

Harvard's standard royalty distribution policy states that for the first \$50,000 of net income, the inventors as a group receive 35%, the inventor's department receives 30%, the Dean of the inventor's School receives 20%, and the University receives 15%. Generally, half the departmental share is placed in a special account under the control of the inventor(s). There is a slightly different formula applied to cumulative net income over \$50,000—the inventors as a group receive 25% and the inventor's department receives 40%, but the rest of the distribution remains the same.

The following standard procedures shall be followed for income received for a single invention/case:

1. Each inventor receives equal shares of the inventor(s)' portion, unless all inventors agree otherwise. A deviation from the policy of equal sharing requires a written agreement of all inventors.
2. If multiple patent applications and patents deal with a single invention/case, each inventor's share shall be determined by a weighted distribution based on the number of US patents/applications on which each inventor appears (only the US patents/applications that are active on the date payment is due are considered). Because new patent applications may be filed over several years or applications may be abandoned and thus inventors may be added or deleted, each inventor's share may change over time. If it is determined that one or more additional individuals are inventors on a patent application for which distributions have already been made, the other inventor(s) on that patent application will not receive further distributions until the individuals newly determined to be inventors have been made whole.
3. If there are Harvard inventors from different schools or departments, then each School's share is divided equally among the Schools and the departmental share is divided equally among the departments, irrespective of the number of inventors in each School or department.
4. If several inventors work in the same laboratory, the head of the laboratory controls the "laboratory share" (i.e., the half of the departmental share under the control of the inventors). If there are two laboratories involved, that share is split equally, irrespective of the number of inventors in each laboratory.
5. If an inventor(s) leaves the originating laboratory and establishes his/her (their) own laboratory within Harvard, he/she (they) may request that a portion of the laboratory share be made available to the inventor(s)' new laboratory. Decisions on such requests will be made on a case-by-case basis by the originating Dean or Dean's designee with input from the laboratory head, department chair and OTL/OTTL.

6. If an inventor who heads a laboratory moves his/her laboratory to a new department or School but retains a Harvard appointment, the laboratory share may, upon request to OTL/OTTL, be reallocated to his/her new department and School. However, the balance of the departmental share and the School share will remain with the original department and School.
7. If all inventors leave Harvard, the “laboratory share” reverts to the originating department—it does not follow the inventors to a new institution.
8. An inventor may waive his/her personal share and direct the money to his/her laboratory for support of research, provided IRS requirements are met.
9. An inventor may assign some or all of his/her personal share to other individuals or organizations, provided IRS requirements are met.
10. If there are no “inventors”—i.e., the invention is a work-for-hire or the result of a project in which there is prior agreement that contributors will not receive any personal share of income—the inventors’ share is added to the laboratory share.

NOTE: If the inventors disagree regarding the sharing among inventors, any one of the inventors may request that the Director of OTTL (or OTL in the case of inventions with only Faculty of Medicine inventors) work with the inventors to “broker” an agreement. If that fails and any inventor wishes, he/she may appeal to the Committee on Patents and Copyrights. Any such appeal shall only apply to as yet undistributed income and future income.

Source: Harvard University.

^aWhile this agreement comes from Harvard University, it is used only as a representative note of similar agreements at U.S. universities. Source: http://www.techtransfer.harvard.edu/RSP_Supplement.html, accessed on Feb.16, 2005.

Exhibit 4 Initial E-mail Documents

From: Thad Simcoe [mailto:simcoe@shahan.university.edu]
Sent: Monday, March 22, 2004 7:48 p.m.
To: ejones@westernpotato.com
Subject: thanks!

Hi Eric,

It was great talking to you today. Thanks for sharing your insights with us and for signing the NDA—as we indicated, we believe we have invented a patentable application.

My contact information is in the signature below. Please feel free to call me or send me an e-mail if you have any questions.

Best Regards,

Thad Simcoe
Simcoe MBA Candidate, 2005
Shahan School of Business
tsimcoe@shahan.university.edu

From: "Eric Jones" <ejones@westernpotato.com>
To: "'Thad Simcoe'" <tsimcoe@shahan.university.edu>
Subject: RE: thanks!
Date: Wed, 24 Mar 2004 16:17:55 -0800

Dear Thad,

We are extremely interested in your project. If your technology works as you describe, it could be worth a small fortune in our business. We would like to work with your firm and would be willing to sponsor additional research in your engineering school, in return for preferred access to the results. I believe we can also be a great source of information and help in testing your new device. Please schedule a meeting or conversation as soon as possible.

Regards,
Eric Jones
Western Potato, Inc.

From: Thad Simcoe [mailto:tsimcoe@shahan.university.edu]
Sent: Friday, 26 March 2004 8:37 a.m.
To: Holburn, Ian (BARI, Northshire)
Cc: Avi Rothman
Subject: Soil pH sensing technology at University

Dr. Holburn,

I am an MBA student at the Shahan School of Business at the University, USA. I recently came across your paper titled "Making sense of pH variability in Scottish potato fields." We are also involved in testing a pH remote sensing technology developed in the College of Engineering at the university. The technology provides a remote method of measuring alkalinity in soil. We are currently prototyping the technology at Douglass Farms in central Florida. You can get some more information about how the technology works from the articles below:

<http://www.university.edu/engrpubs/Anderson/soilph.shtml>

Your work is of a lot of interest to us, and we would really appreciate it if you would share some more insights with us. In addition, we would like to explore the possibility of conducting experiments similar to the ones you conducted in Scotland here in the U.S. or at least explore the applicability of your findings to U.S. potato fields.

If the above is of interest to you, please advise as to what would be the best way for us to proceed. I would be happy to call you at your location if you prefer.

Thanks and look forward to hearing from you.

Best Regards,
Thad Simcoe
MBA Candidate, 2005
Shahan School of Business
tsimcoe@shahan.university.edu

From: Ian Holburn (BARI, NorthShire) [mailto:iholburn@bari.uk]
Date: Wed, 31 Mar 2004 13:05:12 +0930
To: tsimcoe@shahan.university.edu
Cc: CHuang@clarendon.com
Thread-topic: Remote soil pH sensing at the University

Dear Thad,
Thanks for your message.

I am rather aware of what Catherine Huang has been doing, both on account of reading her work in the journals and also chatting with her via e-mail. We have always hoped that she would develop the technology, since it could have wide applications for agriculture. We would be interested in collaborating, but as always, funding is the main obstacle. However, I am somewhat surprised to receive your message from you rather than Catherine, so in the first instance, I would be appreciative if you might fill me in on all the relationships here.

One option would be to chat at the National Potato meeting in New Orleans at the end of June. Unfortunately, my busy schedule only allows three days in the States, but if you and others can travel to New Orleans, perhaps we could discuss potential collaborations over tea?

Regards,
Ian

Ian Holburn
Director
British Agriculture Research Institute

Exhibit 5 Response E-mails

From: Catherine Huang [mailto:CHuang@clarendon.com]
Sent: Wednesday, March 31, 2004 9:20 a.m.
To: Avi Rothman; tsimcoe@shahan.university.edu
Cc: randerson@engineering.university.edu
Subject: [Fwd: Re: Remote soil pH sensing at the University]

Thad and Avi,

The e-mail that you wrote to Ian Holburn (and that I read through his response to you, which he cc'ed to me—see below) is disconcerting. When we talked, you asked me for contact information of other people who are familiar with soil pH sensing so that you could hear their perspective on the remote sensing approach. I suggested that you talk with, among others, Ian Holburn. However, the way in which you represented yourself in the letter to Ian Holburn suggests that you perceive your role/project to be very different than what you described to us. Can you please explain to us:

- 1) Why you did not clearly state that you are working on a business plan to bring the remote soil pH sensing approach to commercialization, but instead stated that you were involved with testing pH sensing at Douglass Farms?
- 2) Why you did not clearly state that you were working with Robert Anderson and myself, and that I had in fact suggested that you contact Ian (rather than implying that you know of him through his paper)?
- 3) What you had in mind when you suggested to Ian that you would like to explore the possibility of conducting experiments similar to the ones he conducted in Scotland here in the U.S. or at least explore the applicability of your findings to the U.S. potato industry.

Please let me know which of the other people that I gave that you have already contacted in such a manner, and please do not contact any of our other colleagues until we talk further. Thank you.

Catherine Huang

--

Catherine Huang
Staff Scientist
Clarendon Electronics, Inc.

Date: Wed, 31 Mar 2004 10:59:23 -0800
To: mlipton@shahan.university.edu
From: Robert Anderson <randerson@engineering.university.edu>
Subject: unethical behavior of Shahan MBA students
Cc: "chuang@clarendon.com" <chuang@clarendon.com >

Dear Dean Lipton,

I need to speak with you. Would you please call me? Please read the correspondence below. I believe that it indicates an unethical behavior of students in your entrepreneurial class. Dr. Huang and I agreed to assist your students for the class project, but it turns out their entrepreneurial skills and aspirations extend beyond class. Unfortunately I do not have the class name, but the team is led by Avi Rothman in your MBA program.

Thanks

Robert Anderson

Robert Anderson, Ph.D.
Christopher H. Foyle Chair Professor of Engineering and Professor of Physics
<http://engineering.university.edu/~anderson>

Date: Wed, 31 Mar 2004 1:07 p.m.
To: Cynthia Burns <cburns@shahan.university.edu>
From: Margaret Lipton <mlipton@shahan.university.edu>
Subject: Fwd: unethical behavior of Shahan MBA students

Cynthia,

Please see the e-mail below. To the extent possible, please identify the class and the instructor.

Regards,
Margaret

Date: Wed, 31 Mar 2004 15:25:17 -0800
To: Margaret <mlipton@shahan.university.edu>
From: Cynthia Burns <cburns@shahan.university.edu>
Subject: Re: Fwd: unethical behavior of Shahan MBA students

Margaret,

There are three students mentioned below, two by name (Thad Simcoe and Avi Rothman) and one by e-mail address (rchatterji@shahan.university.edu). Simcoe and Rothman are both MBAs. The third person is Rhonda Chatterji, a student in the College of Engineering.

All three are currently enrolled in an Independent Study (MBA 710a) focused on research into the nanotechnology field. John Hogue is the supervisor. There are 10 total students in the course, so presumably this team is one of a number of teams.

Simcoe and Rothman are both enrolled in MBA710b—Entrepreneurship with Larry Cohen. So I am fairly certain this must be associated with John's MBA710a. I'd be surprised, however, if Thad Simcoe was involved—he is one of our brightest students. He had admissions offers from Harvard and Stanford, and we only got him with a full university-sponsored fellowship.

Cynthia

At 11:21 a.m. 3/31/2004 -0800, Thad Simcoe wrote:

Dear Catherine and Robert,

First, please accept my profound apologies for this confusion. Our intention in sending the e-mail to Ian Holburn was neither to misrepresent ourselves nor to keep your identities as the developers/owners of the technology hidden.

When I sent the message, I was under the impression that Avi found the paper on the Internet. Had I known that he got the contact from you, I would have specifically mentioned that we were asked to contact you by Dr. Catherine Huang. In fact, that would have given me a lot more confidence in contacting Ian. When I said, "We are currently prototyping the technology at Douglass Farms in central Florida," I meant the university team. I referred him to the articles that clearly stated Catherine's name and mentioned the work at Douglass Farms. Had I known that he was aware of the specific people involved in the project, I would have been more specific in the e-mail itself.

I used the word "testing" because recently we spoke with Eric Jones (e-mail attached), owner of Western Potato in Thatcher, Idaho, who showed a lot of interest in conducting some beta tests on fields (including potatoes). Eric does irrigation management for 50–60,000 acres in southeastern Idaho. Avi was soon going to arrange a meeting between Eric and yourself to discuss the possibilities for beta testing in Idaho. After reading the paper, I felt that Ian Holburn's testing/benchmarking techniques could be useful in quantifying the benefits of the pH sensing technology and help us size the market opportunity for commercialization. Hence, I mentioned that we would like to get Ian's insights and, if possible, help on that. Perhaps we should have waited until after talking to you about the possibility of beta testing in Idaho before going on those lines in the e-mail to Ian.

Besides Ian, we have only contacted Chad Stokes at Iowa State. Avi will send you the details of those interactions.

It was a terrible mistake to not be specific about you and the business plan in the e-mail to Ian Holburn. I apologize again for any inconvenience this may cause to you. I hope you would understand that it was not at all intentional on our part.

Please let me know if you have any further questions or concerns. We will also try to set up a phone or a face-to-face meeting with you soon to clarify the issue.

Sincerely,
Thad Simcoe

X-Sender: randerson@engineering.university.edu
Date: Wed, 31 Mar 2004 17:48:20 -0800
To: "Thad Simcoe" <tsimcoe@shahan.university.edu>,
"Catherine Huang" <chuang@clarendon.com>,
"Avi Rothman" <arothman@shahan.university.edu>,
<rchatteji@engineering.university.edu>
From: Robert Anderson <randerson@engineering.university.edu >
Subject: unethical behavior of Shahan students

Avi, Thad, and the MBA team,

The situation has gone way beyond acceptable, and it is a gross violation of all agreements and understanding that we had. Who has authorized you to contact Mr. Eric Jones and to negotiate a beta test? And when were you going to tell us about that? We spend five years on this and you just waltz in and take over? Didn't I ask you to provide me with applicable confidentiality forms when we met? Where are they?

You created an awkward and embarrassing situation for us and have damaged my reputation. I am in contact with university authorities, and I expect a follow-up on my complaints. At this point I should inform you that I will view any additional step you take on this project, and any communication on this matter, unless authorized, in writing, by either Dr. Huang or me, as an additional violation of our rights and university policy, and I will not hesitate to take any legal action needed to remedy the situation.

Professor Anderson

Robert Anderson, Ph.D.
Christopher H. Foyle Chair Professor of Engineering and Professor of Physics
<http://engineering.university.edu/~anderson>

From: Margaret Lipton [mailto:rlipton@shahan.university.edu]
Sent: Wednesday, March 31, 2004 5:52 PM
To: jhogue@shahan.university.edu; lcohen@shahan.university.edu;
cburns@shahan.university.edu
Subject: ADDENDUM to: unethical behavior of Shahan students

FYI.

Date: Wed, 31 Mar 2004 20:00:45 -0800
From: Larry Cohen <lcohen@shahan.university.edu>
To: 'Margaret Lipton' <mlipton@shahan.university.edu>
Cc: jhogue@shahan.university.edu,
cburns@shahan.university.edu
Subject: RE: ADDENDUM to: unethical behavior of Shahan students

Margaret

I just met with the students in question. They are in my MBA710b class. They brought the situation to my attention on their own initiative. Clearly this is unfortunate—but one can understand how it arose—as the students are encouraged to do primary research and talk with people in the marketplace. This project has uncovered enormous potential—I just got a call of congratulations from Jim Camden. Apparently he has been contacted by a firm that wants to fund new research in the engineering school. I have encouraged the students to try to communicate with the PIs immediately and face to face. I am convinced they were well intentioned and hopefully can put the relationship back on track. I have also offered to intervene if things go south from here—but I don't think personally interceding at this point is best. I want them to see what they can do.

Effective immediately the students have agreed to:

1. Terminate any discussions with anyone outside the PIs team, and the faculty here at Shahan, about this project.
2. Meet with the PIs, give them full details on all contacts, discussions, etc.
3. Ask permission to complete the project under the above constraints.
4. Invite the PIs to the final presentation, where they will benefit not only from the business plan itself—but seeing their work critiqued by the faculty and investing professionals.

I will keep you informed as this situation progresses. Please do the same if you see developments from your perch.

Larry

From: Thad Simcoe [mailto:tsimcoe@shahan.university.edu]
Sent: Wed, 31 Mar 2004 23:36:45 -0800.
To: randerson@engineering.university.edu
Cc: lcohen@shahan.university.edu, arothman@shahan.university.edu
Subject: Apologies

Dear Robert

This is to assure you that from this point on, we will take no further step on this project including communication with any third party, unless authorized by you or Catherine.

We are deeply sorry that you are dissatisfied with us. We never intended to cause any harm to you or your project. We would like to have an opportunity to meet with you and Catherine to present the work we have done so far and share with you the information we have collected.

Please advise on what would be a suitable day and time for you to meet.

Best regards,
Thad Simcoe on behalf of the student MBA team

Date: Thu, 01 Apr 2004 06:41:32 -0800
From: randerson@engineering.university.edu
To: Thad Simcoe; tsimcoe@shahan.university.edu;
Cc: 'randerson' randerson@engineering.university.edu; Catherine Huang' chuang@clarendon.com, jsnyder@shahan.university.edu; Avi Rothman', arothman@shahan.university.edu; rchatterji@shahan.university.edu
Subject: RE: unethical behavior of Shahan students

Before we have any additional discussion, I will expect to get from all of you, by the end of business day today, fully executed university confidentiality agreements. If this does not happen, I will consider it as further violation of our rights and of university policy.

Professor Anderson

Robert Anderson, Ph.D.
Christopher H. Foyle Chair Professor of Engineering and Professor of Physics
<http://engineering.university.edu/~anderson>

Date: Thurs, 01 Apr 2004 0904:13 -0700
From: Bart Hinton <bhinton@tco.university.edu>
To: randerson@engineering.university.edu
Subject: New disclosure on pH sensing technology
Cc: lcohen@shahan.university.edu

Dear Professor Anderson,

Let me first introduce myself. I am Bart Hinton, recently hired at the Technology Commercialization Office and assigned to the pH sensing technology case (you may remember me from your undergrad physics class last year). I have heard about exciting new developments in your sensing research, and I need to get a disclosure before you publish the work. This will obviously allow us to write the strongest possible protection for your work and enable us to fully exploit its commercial opportunity. Please contact me at your earliest convenience to set up a meeting.

Best,

Bart Hinton

Date: Thurs, 01 Apr 2004 09:07:01 -0700
From: Bart Hinton <bhinton@tco.university.edu>
To: lcohen@shahan.university.edu
Subject: New disclosure on pH sensing technology

Dear Professor Cohen,

Per the voice mail I left you today, could I please get the names and e-mail addresses of the four pH sensing project students? They will need to sign the forms that assign rights for the new invention to the university.

Best,

Bart Hinton

Date: Thurs, 01 Apr 2004 09:34:13 -0700
From: Margaret Lipton <mlipton@shahan.university.edu>
To: randerson@engineering.university.edu,
Cc: 'Catherine Huang' <chuang@clarendon.com>, tsimcoe@shahan.university.edu,
'Jessica Snyder' <jsnyder@shahan.university.edu>,
'Avi Rothman' <arothman@shahan.university.edu>,
rhatteji@shahan.university.edu,
lcohen@shahan.university.edu, cburns@shahan.university.edu
Subject: RE: unethical behavior of Shahan students

Dear Professor Anderson,

Regarding your e-mail below and the ones that preceded it, I have now identified that the students are enrolled in a Shahan course whose instructor is Larry Cohen (cc'ed above). Larry has met with the students and advised them how to proceed, including meeting with you in person. To the extent that this matter has not yet been resolved to your satisfaction, please contact Larry at "lcohen@shahan.university.edu" or 5-6613. Larry has conveyed to me his willingness to speak with you and to mediate to the extent required.

On behalf of the Shahan School, please accept my apologies for the situation in which you and your colleague now find yourselves.

Regards,

Margaret

Exhibit 6 Timeline of Events