

**Student Intellectual Property**  
**SENIOR PROJECT**

**IT461/462**

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John Baumwoll and Lance Woodcock

## Table of Contents

	Page
Abstract	iii
Acknowledgements	iv
Section	
I.    Introduction	1
II.   Literature Search	6
III.  Solution	21
IV.  Discussion	26
V.   Conclusion	32
VI.  References	38
Appendix	
Example: Cal Poly Office of Technology Transfer Informational Handout	39

## **ABSTRACT**

During the past several decades there has been an exponential growth of patents and other government granted protections given to University created intellectual property. With this rise in patents and other protections, Universities are gaining an understanding of what these mean for the University, both in notoriety and in fiscal returns.

This senior project explains and suggests methods through which students and faculty can become better informed on intellectual property and technology commercialization while obtaining an education here at California Polytechnic University, San Luis Obispo. Through review and evaluation of other Universities throughout the nation, this project will provide students up to date methods and practices to gain intellectual property protection. With the information provided, students' education can reach beyond the walls of Cal Poly and into their professional lives.

The proposed project has been developed and reviewed with the help from University faculty members, as well as Dr. Lou Tornatzky, this project's faculty and technical advisor. The resulting project will provide a several methods by which Cal Poly, San Luis Obispo can improve their Office of Technology Transfer. This improvement would serve both the University and the education provided to students.

## **Acknowledgements**

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**- Jim Dunning:** C<sup>3</sup>RP project administrator – The authors of this report would additionally like to take the opportunity to thank Jim Dunning for his efforts associated with C<sup>3</sup>RP and Cal Poly's Office of Technology Transfer. Jim took time out of his schedule to meet with us and provide relevant and necessary information.

# CHAPTER I

## INTRODUCTION

This portion is intended to provide a brief and succinct overview of our report and its findings. In this section we intend to describe the major problem, possible solution(s), how those solutions will inform students on the topic of technology transfer, and additionally address certain limitations of this project. These areas are all addressed in much greater detail throughout the body of our report.

### **Problem Statement:**

Each year, at universities around the globe, students create intellectual property or patentable material that is simply lost or abandoned due to a lack of information regarding its possibilities beyond the classroom. Currently, there is very little information available to both students and faculty pertaining to the process of technology transfer at Universities. Furthermore the amount of information on the commercialization of technology generated from undergraduate students is virtually non-existent. Certainly there are ways for students to get their Intellectual property patented or otherwise protected. However, from research it is the authors understanding that the average student does not know how to go about this process. The aim of this report is to provide methods through which the Office of Technology Transfer can better inform both students and faculty of this process. After speaking with students and a basic review of the available literature, the authors have identified a need for generating awareness of technology transfer in a University setting. As students are unaware of technology transfer, it can be assumed that they are also not aware of Cal Poly's office of technology transfer.

Through this project the authors intend to create several methods that if applied could both improve technology transfer at Cal Poly, and create a student body that is better informed on the commercialization of intellectual property generated by students. It is the hope of this report that much of the intellectual property created by Cal Poly students can successfully be transformed into protected. This process can be beneficial not only for the students, but also the Universities they attend. Students must understand that there are legal requirements and necessary research relating to these issues. Universities and students alike have rights that pertain to these issues; these rights can be both vague and ambiguous, often intimidating or deterring the students from pursuit. It is our hope to give students a better understanding of the legalities involved in this process. Cal Poly's current Office of Technology Transfer currently deals more with the licensing and distribution of patents the school currently owns. On the website however, there is no clear and concise explanation of the path either students or faculty can follow in order to take intellectual property and have it patented. While Cal Poly does have an intellectual property policy, it is simply that, a policy describing what rights the inventor and university have to their property. It is with all this in mind that we desire to provide several suggestions for ways that Cal Poly can improve the dissemination of information on technology transfer in the University setting.

### **Needs:**

Due to the scope of this project, the needs will be varied as they pertain to each student's different material. As this project is focused on students and what they need to do, in order to protect the material they develop while at school, they firstly must be informed. Students must understand what is involved in obtaining these protections. They need to understand the procedures they must follow and what they must obtain prior to approaching Cal Poly's office of technology transfer. When it comes to the protection of material, different types of material are protected by different legal means. Some of these protections include but are not limited to copyrights and patents; the protection is obviously based on the type of material the student generates. However while the individual cases and needs will be different, we believe that a basic process can be set up for the use of any and all material. As a result, the needs can somewhat be grouped together. These needs include 1) a standardized overview of student rights

relating to intellectual property 2) documentation that clearly defines the differences between patents, copyrights, and trade secrets; and each type of protection available to students 3) useful literature on how students can go about obtaining information relating to their idea including current patents and other protected material and 4) a clearly defined method for taking their material from idea to protected material. This report will also include what rights the university has, and how the university and students can coordinate to be mutually beneficial.

<b>Needs:</b>	<b>Importance: Scale of 1-4</b>
Clearly defined literature explaining the difference between intellectual property, inventorship, and patentability.	3
Standardized overview of both student and university rights pertaining to student generated material	4
Information pertaining to how students can research current intellectual property relating to their idea	2
Determine several methods for students and faculty to gain knowledge regarding technology transfer in the university setting.	4
An informational handout containing information about the transfer of technology at University.	3
A current summary or overview of other Universities that have successful documentation and processes for students to follow.	3

### **Background and Related Work:**

Cal Poly is only one of the thousands of Universities around the nation, as such; this problem is dealt with by nearly every University. Some Universities obviously, due to funding and past experience, have developed systems better than others. As the authors research this project and delve into these University's solutions, a better understanding of not only what is involved in this process, but the different approaches that are available to both students and Cal Poly is gained. After research and speaking with technical and other advisors, the creators of this report found

several Universities that stood out, with regard to their current student technology transfer process. These Universities include Purdue, University of Florida, Stanford University, and Cal Tech. All four of the universities have an office dedicated to the licensing of technology, physical or otherwise. With a small amount of effort their websites can be found, on which, they explain the process for both students and faculty to follow in order to obtain intellectual property protection. Through these websites, a better understanding of the technology transfer process was gained. Undergraduate students in general, are not working on research projects, or given projects through which protection worthy material is generated. With this in mind, much of the literature found was more directly related to University faculty and graduate degree candidates.

### **Potential Solution(s):**

When attempting to define a potential solution to the problems students face with regards to the protection of intellectual property here at Cal Poly many issues arise. However it is the hope of the authors to create, in conjunction with Cal Poly, and develop several methods that if implemented could improve student's knowledge of commercializing student generated intellectual property. It is hoped that this can be done both to the benefit of the student and University alike. This project is intended to generate several alternatives that improve student knowledge regarding intellectual property and the technology transfer process. The alternatives provided are a informational handout the student can obtain from his or her college office, improvements to the staffing and website of Cal Poly's office of technology transfer, and open seminars providing information on patents and technology transfer.

### **Contribution:**

The solution offered later in this report is intended to enable students to successfully translate work and projects created while at Cal Poly, that can be defined as innovative and unique property, into patents and other protected material to the benefit of both student and University. With this proposed solution students will be able to leave Cal Poly with a tangible sense of accomplishment. Not strictly that of their degree, but also with something that they can use to



better obtain employment in a difficult job market. This solution should simultaneously contribute to the improvement of Cal Poly. Through this project, Cal Poly can give to students opportunities beyond an education, opportunities that will extend beyond its wall and into the careers and lives of its students. The amount of patents and other protected property created at the University level has grown exponentially over that past several decades. This project will enable Cal Poly to take part of this continuing trend.

**Scope of Project:**

This project is intended to cover current trends and processes used by other Universities. This report will explain to whom these protections are available and what the associated protections are. The report will include definitions of these different protections, as well as to what, each one is applied. It will cover the processes in place at other Universities, in addition to Cal Poly's current Intellectual Property Policy. This project will create a path for students to follow to obtain protection for their individual intellectual property. While this report will contain a guideline for students to use to obtain protections, it can in no way cover all individual basis and inventions. Just as the protections afforded are unique in nature, so too are the students inventions.

With this in mind, this project is intended to create a rough outline and not an exact step by step process for the protection of material. In addition, students must understand that the obtaining of a patent or other protection is a long process, years and not weeks. As such, the students must understand that a significant amount of work on their part is expected and therefore is also up to them to determine the amount of time this process will take. The project will also contain a way for students to access the necessary information required. Obtaining protection requires a lot of research regarding what has come before, this project therefore cannot give students that information, rather it can simply guide them in the path to finding that information.

## **CHAPTER II**

### **Literature Search**

#### **Literature Review for *Patent It Yourself***

#### **What is Intellectual Property?**

According to Patent Attorney David Pressman, intellectual property “Refers to any product of the human mind or intellect, such as an idea, invention, expression, unique name, business method, industrial process, or chemical formula, which has some value in the marketplace, and that ultimately can be reduced to a tangible form, such as a computer, a chemical, a software-based invention, a gadget, a process, etc. Intellectual property law, accordingly, covers the various legal principles that determine: who owns any given intellectual property, when such owners can exclude others from commercially exploiting the property; and the degree of recognition that the courts are willing to afford such property (that is, whether they will enforce the owner’s offensive rights).

#### **What is a Patent?**

To understand the patent process, one must understand what it means. A patent is a legal document granted by the government that protects the owner (which can be an inventor, person, or business) with exclusive rights of using, creating, or selling that invention. A patent can be sold by the owner and the owner can also give permission to other parties to use the invention. Anyone can file for a patent as long as they are the sole inventor.

## **Types of Patents**

There are three types of patents that can be filed. The first type of patent is called a utility patent. A utility patent is the most common patent type. This type protects the structure and function of the unique invention. This patent can last up to 20 years. The second type is a design patent. A design patent is one that covers the unique appearance of an object. This can include, for example, a design for a cell phone or even a computer icon. Design patents last up to 14 years from the date of filing. The last patent type is the plant patent. A plant patent gives plant breeders rights to breeding new varieties of plants. Plant patents can last up to 20 years.

## **Invention Must Satisfy “Novelty” and “Unobvious” Requirements**

Every patent (utility, design, and plant) must be examined by the Patent and Trademark Office (PTO). The examiner must be convinced that the invention is a novelty as well as unobvious. To be a novelty, the invention must be different from what is already publicized. To be unobvious, it must be unobvious to someone skilled in the trade. It must also be useful and produce unexpected, surprising, or superior results to prior technology.

## **Documentation**

One of the first steps in acquiring a good patent is to document as much data as possible. Keep the data organized, dated, and signed. This documentation may become critical to proving inventorship. A lab notebook may also be a good idea to log information. Make sure to document all drawings, prototypes, research and development, and any other information used to develop the invention. Good documenting techniques will not only increase the likelihood of obtaining a patent, but it is also proved to be good engineering practice. Many design flaws or errors can quickly be identified and fixed when an invention is documented well.

## **Is the Invention Patentable?**

Before a patent can go further in the patent process, one must first know if the invention is legally patentable. Just because an invention has been proven to be commercially viable, does not necessarily mean that the invention is patentable. If the invention is patentable, however, it will greatly increase the chances of its commercial viability.

To obtain a utility patent, the invention must pass certain legal requirements. The requirements for a utility patent are as follows: the invention must be unobvious, must have a novelty, must be useful, and it must be in a statutory class. As stated earlier, to be a novelty, the invention must be different from what is already publicized. To be unobvious, it must be unobvious to someone skilled in the trade. It must also be useful and produce unexpected, surprising, or superior results to prior technology. To fit the criteria of being in a statutory class, the invention must be one of the five classes that are established by Congress (35 USC 101). The criteria are as follows: must be a process (method), a machine, an article of manufacture, a composition, or a novel use of any of the above.

## **Marketability of the Invention**

Once the invention has been fully documented, prototyped, and tested, it is crucial to evaluate the invention for salability. A common misconception is that once the invention is patented, the inventor will make a lot of money. This is not necessarily the case, according to David Pressman, less than one out of ten make any money from their patent. The marketability of any invention will play a crucial role in answering the question if the invention will sell. No one can be 100% confident that their invention will sell, but there are a variety of ways to help ensure that the invention has the highest chance of survivability.

It is suggested to start at a small scale level and once this turns into a success, grow from there. Most projects' costs are underestimated and running out of money could be detrimental.

It is also highly recommended that an evaluation of commercial feasibility is conducted. This evaluation can be done by doing a “pros and cons” test. Write out all of the positive factors of the invention and then write out all of the negative factors. Determine to ensure that the positive factors outweigh the negative factors.

There are many factors that can affect the marketability of an invention. Some factors to consider are the cost of the product, the size of the product, weight of the product, and how easy it is to repair the product. Other factors that can affect marketability are the aesthetic appeal of the invention, the invention’s reliability, and so on.

Another way to ensure the salability of an invention is to perform a thorough market research report. Make sure to contact a variety of sources in the market of the invention. This means to contact engineers, managers, sales representatives, and manufacturers in the field. It will be useful to find out if the market is growing or not. While conducting the marketing research, make sure not to disclose any details about the invention.

### **Patentability Search**

A patentability search is a crucial step in acquiring a patent. To be done correctly, this search must be done carefully and thoroughly. Not only will this search help to find out if the invention is even qualified to be patented, but it will also help widen one’s knowledge in the field and allow for a stronger patent. Performing a patentability search will also be beneficial to help avoid unneeded expenses and extra work. Doing the search for the invention will also permit understanding of what needs to be prepared and included in the patent. This could include drawings, operability, and design. The search could also help prove if the invention will be commercially viable or not.

### **When a Search is not Necessary**

Although the patentability search process is a crucial step in obtaining a patent, it is not always necessary. If the invention created is in a new or arcane field, it is most likely a waste of time to do a search. This is because it will most likely take awhile to find any results since the field is so new. Also, if the invention is in a new field, the inventor most likely is up-to-date with journals and essentially what is going on in that field. Before deciding to perform a patentability search or not, make sure that the inventor is highly knowledgeable about the field. Another reason to not perform a patent search is if the current invention is an improvement or slightly different from a patent already held by that inventor because the search has already been performed for the prior invention.

### **Ways to Perform a Patentability Search**

There are two ways to performing a patentability search. The first way is to do the search personally. The second way is to hire a professional to do it for you. The benefit of performing the search personally is to ensure completeness as well as gain knowledge through the search. Performing the search personally will also save a lot of money. Having the search done professionally, however, will save time.

### **Performing a Patentability Search Personally**

There are three possibilities to perform the patentability search personally. The first way to search is to go to the Patent and Trademark Office (PTO) in Arlington, Virginia for the most complete and thorough search. If this is not a feasible option, the next option would be to search any local Patent and Trademark Depository Library throughout the country. The last option to perform a patent search is to do a thorough computer search.

## **Hiring a Patent Professional**

There are three different ways to hire a professional to perform a patentability search. A lay patent searcher, a patent agent, or a patent attorney can be hired to perform the search. A lay patent searcher can be found in the Yellow Pages under “Patent Searchers.” Lay patent searchers are generally less expensive than patent agents or patent attorneys, but do not understand the unobvious requirement as well. Before hiring a lay patent searcher, make sure to look at the searcher’s background and experience.

A patent agent can also be hired to perform a patentability search. A patent agent is one who has some technical training and is licensed by the PTO to prepare and prosecute applications. A patent agent is able to perform a patent search and can express opinion about patentability. A patent agent however, cannot represent in court, cannot handle trademarks, and cannot handle licensing or infringement suits.

Lastly, a patent attorney (or patent lawyer) can also perform a patentability search. The patent attorney must be licensed not only by the PTO, but also by the attorney-licensing authority of at least one state. A patent attorney can represent in court, can handle trademarks, and can handle licensing or infringement suits. A patent attorney is the more complete package solution, but may also cost more.

## **Literature Review for Global Dimensions of Intellectual Property Rights in Science and Technology**

Students develop and create ideas and material daily throughout their time at school.

Unfortunately, much of this information is simply left in idea form. Students come up with great ideas and often use them to create projects and products. However, more often than not, these ideas and products end up left behind, sitting on shelves and desks. Through this senior project the hope is to create a more viable way for students to transform these ideas and products into

legally protected material both they and the university can benefit from. To do this, we must conduct an extensive literary search of current methods and processes used by other universities and institutions of higher learning. This literary search is key to the success of the project in that it will offer insights and other key information into the way this is currently being handled by other universities around the nation and the world. This section will include a search of processes that other universities have and still use. Some successful products will be looked into that were developed at universities and translated into successful business ventures. Reasons and issues will be looked at that have not been done before including problems and shortfalls relating to legalities. Finally, this project will discuss ways to add to previous studies and improve what has been done before that can both benefit and assist this project.

By restricting imitation Intellectual Property Rights arguably raise the cost of the new technology and restrict its availability. Intellectual Property Rights (IPR's) inherently embody a policy conflict between the objective of providing an incentive to technological innovation and the objective of encouraging the rapid diffusion of new technology and the accumulation of technological knowledge. IPRs are generally a matter of national jurisdiction (i.e. the protection offered to an innovation is governed by the laws of the nation in which the innovation is made, used, or sold.) Universities and research institutions in which basic scientific research is performed have traditionally put a premium on early dissemination of results, which is at odds with the requirements for obtaining patents. In many countries, any disclosure of an invention before a patent application has been filed precludes patentability.

Infringement, which refers to the transgression of a legally recognized right that is usually litigable in the courts, is the term generally used in relation to the violation of most forms of intellectual property rights, except for trade secrets, in which case violation is termed misappropriation. In the U.S., patent infringement is defined as the unauthorized making, using, or selling of any patented invention within the United States. Piracy, although not a legal term of art, refers primarily to unauthorized reproduction for commercial gain of literary, musical, artistic, and other copyright works. Counterfeiting is a term used most often to refer to



unauthorized duplication of a products trademark to give a similar appearance to a specific product. The 1988 ITC study reported estimated aggregate worldwide losses of \$23.8 billion in 1986 for key U.S. industrial sectors due to inadequate intellectual property protection.

## **NCGE Literature Review**

### **Background Information**

According to the National Council for Graduate Entrepreneurship, there has been an increasing number of higher education students involved with entrepreneurial activities and new ventures. Intellectual property issues however, can prove to be a major hindrance to the process. It is also possible for students to develop a negative perception of the university if the university appears to be involved for financial benefits solely. This is why it is important for the university to create a well managed and student-friendly policy that can be easily read and understood.

### **Project Achievements**

The NCGE performed research on both students as well a university policies to prove that concerns about intellectual property policies are indeed a concern nationwide. Funding was also provided to research how universities were dealing with these issues. A survey was conducted to identify intellectual property awareness, assignment of intellectual property, education and training, institutional practices on student intellectual property (including protecting and commercializing student IP and financial resources), and personal perspectives of institutional policy and practice of student intellectual property. Seventeen face- to- face interviews with students concerning their intellectual property experience were also conducted to support their research.

## **Findings**

Findings in this research focused on following six major issues: the institutional perspective, collaboration, policies and procedures, communication, education and IP protection and commercialization. The institutional perspective is beginning to change in that universities are beginning to realize the importance of student intellectual property and that it requires more attention. According to the NCGE, some universities see student intellectual property as a benefit from a financial standpoint. Other universities have a softer approach; they believe that they can provide the students with a superior learning experience and increase the reputation of the institution while enhancing the growth of the enterprise culture.

Collaboration between the university and the student was found to not depend on university policy. Collaboration appeared to depend more on a subjective issue. How each party understood the other was deemed crucial on this issue.

During the research conducted, policies and procedures were found to be out of date. It appeared that there was a lot of confusion and that the policies did not reflect current practice. Policies and procedures were often convoluted and unreachable to the students. They were also poorly written and difficult to understand. A potential solution to this problem would be to not have intellectual property experts solely write the policies and procedures.

Confusion about intellectual property issues, policies and procedures was also evident. Ethical questions arose that students do not have the appropriate knowledge and understanding to make decisions in assigning intellectual property.

A key to improving intellectual property is to educate both the students and the staff. Current intellectual property education is either absent or is scarce. According to the NCGE, “There are barriers to overcome in terms of making IP education more accessible and these include, resistance to the idea that non-experts can input on IP, getting IP embedded in the curricula, accepting that IP knowledge is relevant in other aspects of employment and research (not exclusive to new ventures or commercialization), making IP discipline or sector specific and considering the timing of any input and ensuring content is relevant to needs.”

Protection and commercialization of the project depends upon practical support as well as funds for protecting intellectual property. The process by which the university deals with the students is also crucial. The effectiveness of the process can be determined by the position the university takes on student intellectual property, the quality of support, and the extent of collaboration between parties.

## **Results**

Of course, the quality the student will experience depends on the university, it is suggested that the NCGE develop a strategy to approach to influence policy makers, educate the educators, and develop future entrepreneurs. It is encouraged to influence policy makers, educate technology transfer, and promote further projects.

According to the NCGE:

“The aims of the project were to:

- i. Investigate how student undergraduate and postgraduate IP is currently managed across the HE sector (both pre and post 1992);
- ii. Identify pertinent issues in the management of IP particularly in respect of postgraduate students;
- iii. Inform changes in current practice to enhance both the student and institutional experience to mutual benefit.

“The expected outcomes for the project were:

- i. An understanding of the extent and nature of issues arising from the management of student IP, particularly in relation to postgraduate students;
- ii. The identification of potential good practice in the management of student IP;
- iii. The raising of awareness in relevant communities as to the current issues and possible management strategies;
- iv. The identification of practitioners who may form an interest group;
- v. Recommendations for any future project that would attempt to influence current practice. “

### **Purdue University Review**

Purdue University has a pretty well laid out website for the Office of Technology Commercialization. To go to Purdue’s inventors page one must go to Purdue’s main page. From there, scroll to the “Research” tab. Once the tab is pulled-down, one must click on “Purdue Research Park”. At the bottom of the page, near the middle click on “Office of Technology Commercialization” followed by clicking on the “Inventors” tab.

The “Inventors” tab is quite useful. This page explains what to do once an idea is conceptualized. There is a processes and policies link on that page. Each link provides a summary of the key points of the processes and policies. The processes link has an easy “1-2-3’s of tech transfer at Purdue University” section which explains that the first step is that a student, faculty member, or staff must come up with an idea. Next, all inventions developed by Purdue must be disclosed to the Office of Technology Commercialization. Lastly, researchers should file either a technology assessment form or an Invention Disclosure Form depending on the stage of the invention. This page then explains a technology assessment, a full disclosure review, a disclosure assessment, how to file for a patent, the difference between licensing to a startup versus an established company, and revenue distribution.

The policies link opens a page of a summary of Purdue's Intellectual Property Policy. This page describes what intellectual property is. It also explains how Purdue manages intellectual property. Purdue has three intellectual property policies: 1. Intellectual Property Policy 2. Use of Copyrighted Materials for Education and Research Purposes (Memorandum B-53) 3. University Policy on Conflicts of Interest and Commitment. This page also talks about who is responsible for managing intellectual property at Purdue.

### **Stanford University Review**

After searching for the Office of Technology Licensing from Stanford's main website, one will find the Office of Technology Licensing page. There is information about the office, inventor information, and also industry information that can be quite useful. By clicking on the "For inventors" information tab, one can find information about the process, Stanford's policies, information on intellectual property, resources, disclosures, and a frequently asked questions section.

By clicking on the "Our Process" tab, inventors can find out what to expect while working with Stanford. This process includes an inventor's disclosure form, associate assignment, evaluation, patent application, marketing and licensing negotiations, monitoring progress, information on royalty sharing, equity sharing, and amending licenses.

The next tab is "Our Policies". This section includes inventors' rights and responsibilities, university and office procedures, and guidelines. There is a section that defines the Office Technology Licensing and the Inventor: Roles in Technology Transfer, the patent policy, Copyright Policy, Tangible Research Property (TRP) Policy, ownership, royalty sharing, third party licensing, sponsored research, signature authority, U.S. government-funded inventions, outgoing material transfer agreements (MTAs), links to university policies on conflict of interest, equity acquisition in technology licensing agreements, the Stanford industry interactions policy, and also export control reminder memo from the dean of research.

There is also a section on intellectual property. This section has information about patents, software, copyrights, and tangible property. Patents are generally used for inventors, copyrights are used for creative works such as software, literary works, photographs and musical compositions, software is used for software-based creations, and tangible property is used for biological materials, engineering drawings, computer software, integrated circuit chips, computer databases, prototype devices, circuit diagrams, equipment, and associated research data.

The “Disclosures” tab provides information about the disclosure process, as well as printable and on-line forms. There is an online disclosure form in Researcher Portal, PDF disclosure, PDF instructions, and there is also a disclosure frequently asked questions section.

Lastly, there is a frequently asked questions section. This section provides answers to common questions inventors have about patents and licensing. Some questions that are answered include the following: why should I disclose an invention to OTL?, Do the Inventors benefit from licensing the invention?, what is intellectual property?, what is the role of OTL?, If I want to consult with a licensee, what do I do?, along with many other questions.

### **California Institute of Technology Review**

The California Institute of Technology’s Office of Technology Transfer is a relatively young office. Started in 1995, the Office of Technology Transfer has become relatively successful for such a small university. Over the past ten years the Office of Technology transfer has produced on average nearly 40 to 50 patents per year. In addition, it creates 8 start-up companies on average per year.

The Office of Technology Transfer’s approach is very similar to many other schools; however their success can be linked to several key factors. First, and most importantly the relationships

maintained with faculty members and students. As an office they make sure that the faculty and students are not only aware of their existence, but more importantly that they are part of the effort of pursuing protection for intellectual property. Maintaining these relationships and nurturing these relationships can be and is a very important part of the process. Making sure that the inventor feels as though they are part of both the patenting process and commercialization process allows for open communication during each and every step of the process. Second, the promotion of entrepreneurship; it is their belief that entrepreneurship is a benefit to the school. The office maintains that these start-ups provide a number of benefits including faculty retention, job growth, and economic development. This belief not only encourages both faculty and students to bring intellectual property to the office; it also encourages the office staff to pursue protections for the property of the faculty and students. Thirdly is the aggressive manner in which they pursue intellectual property protection. The office files provisional patent applications on nearly all invention disclosures it receives. Furthermore it pursues non-provisional patent protection on nearly half the inventions it receives. By following these guidelines combined with a number of other factors, has lead to a successful approach for technology transfer.

Cal Tech's Office of Technology Transfer has clearly laid out in their website a practical and easy way for both students and faculty to pursue protection of intellectual property. Their website is laid out in such a way to provide relevant literature and information regarding all areas of technology commercialization. With ease, students and faculty can find out not only how to locate the office and whom to speak with; but other relevant information such as guidelines for patentable material, the office's approach to commercialization, and even a endowment program set up to fund a technology start-up. Additionally provided to all concerned parties on the website is a invention disclosure form with which the office can use to immediately begin processing the request.

**University of Florida:**

The University of Florida's Office of Technology Licensing has since 1985 been extremely successful at technology commercialization. Researchers at the University of Florida generate over 300 invention disclosures per year. The Office's website has an extremely clean layout with clearly marked tabs demarcating significant information for inquisitive visitors.

When looking at the website, the first thing of note is that there is clearly no reference to or suggestion of how students can participate in the process of technology commercialization. Be that through patent or trademark protection. The focus of a University's Office of Technology Licensing on faculty is, in general expected. However with the commercial success and revenue stream generated through the office; the idea that they would attempt to include students in the process is not a stretch. By not including any mention of a student's ability to contribute to the commercialization of technology the University is both limiting the scope of the students education and inhibiting his possible success in this process.

The success of the University at technology commercialization is evident immediately. The Office of Technology Licensing has clearly put effort into not only the layout of the website, but also the information available through it. Browsers can look through various success stories, technologies currently available for licensing, along with current companies resulting from University of Florida technologies. The Office also maintains a mentoring program for those desiring generate a start-up from a licensed technology.

Faculty, and by default students, can also look through the Faculty Resources tab for information pertaining to what to do with any Intellectual Property. This tab opens a new page providing browsers with general information as well as forms and the invention disclosure process. Finally with a press of the contacts tab users can access information regarding staff of the Office and also its location and other related information.



## **CHAPTER III**

### **Solution**

This portion is intended to provide solutions for the objective of this project which is to provide students a guideline to obtain patents and protect their intellectual property. This section provides possible solutions, describes each alternative solution, explains how these solutions will enable students to obtain patents easier, and also defines the limitations of each solution. Much of the research has been reviewing other respected universities and how they handle this problem. Although there is not one perfect solution, there are many different suggestions that can help the current problem. The overall goal is to increase student body awareness. Currently, students are often oblivious to the patent policy and process at Cal Poly. There are three different approaches to the given problem. The first problem that was encountered was that the website is quite confusing and very little information can be gained by looking at it. Cal Poly should consider improving their Office of Technology website and increase staffing at the office. The second solution is for the University to provide student seminars. The final solution is to create handouts for students that have applicable information on them.

#### **Improve Website and Increase Staffing**

Currently, the Office of Technology website at Cal Poly is quite insufficient for student use. The website is quite confusing and information is very difficult to find on it. Searching the website often provides few helpful results. There is a major need for restructuring and reorganizing the website.

An example of a university website that has a decent website is Purdue University. Purdue University has an inventor's tab which explains what to do once an idea is conceptualized. There is a processes and policies link on that page. Each link provides a summary of the key points of the processes and policies. The processes link has an easy "1-2-3's of tech transfer at Purdue University" section which explains that the first step that a student, faculty member, or staff must come up with is an idea. There is information on how to file either a technology assessment form or an Invention Disclosure Form depending on the stage of the invention.

Purdue University includes a policies link which opens a page of a summary of Purdue's Intellectual Property Policy. This page describes what intellectual property is and also explains how Purdue manages intellectual property. Purdue has three intellectual property policies: 1. Intellectual Property Policy 2. Use of Copyrighted Materials for Education and Research Purposes (Memorandum B-53) 3. University Policy on Conflicts of Interest and Commitment. This page also talks about who is responsible for managing intellectual property at Purdue.

Another example of a good website design was Cal Tech. Cal Tech's Office of Technology Transfer has clearly laid out in their website a practical and easy way for both students and faculty to pursue protection of intellectual property. Their website is laid out in such a way to provide relevant literature and information regarding all areas of technology commercialization. With ease students and faculty can find out not only how to locate the office and whom to speak with; but other relevant information such as guidelines for patentable material, the office's approach to commercialization, and even a endowment program set up to fund a technology start-up. Additionally provided to all concerned parties on the website is an invention disclosure form with which the office can use to immediately begin processing the request.

Additionally, we believe that the Cal Poly Office of Technology should be easy to find under the "Research" tab or by using the search function of the website. The University of Florida proves to have another successful website. The success of the University at technology

commercialization is evident immediately upon viewing their website. The Office of Technology Licensing has clearly put effort into not only the layout of the website, but also the information available through it. Browsers can look through various success stories, technologies currently available for licensing, along with current companies resulting from University of Florida technologies. The Office also maintains a mentoring program for those desiring to generate a start-up from a licensed technology.

Faculty, and by default students, can also look through the Faculty Resources tab for information pertaining to what to do with any Intellectual Property. This tab opens a new page providing viewers with general information as well as forms and the invention disclosure process. Finally there is a contacts section which allows users to access information regarding staff of the Office and also its location and other related information.

Cal Poly's Office of Technology website should also include a flowchart showing the necessary steps in obtaining a patent. The steps should include the process of ensuring that the invention is indeed patentable and fits the unobvious and novelty requirements. Documentation is key and everything should be dated and notarized. A disclosure form should be completed as well. The next step is to perform a patent search to ensure originality. Depending on the University's willingness to help, the patent search may or may not be performed by the school.

A frequently asked question section should also be included on the Cal Poly Office of Technology website. This section provides answers to common questions inventors have about patents and licensing. It should include a patent definition along with the different types of patents defined. Other questions include what is a license, who can file for a patent, what is intellectual property, who owns what is created, how long the process is, and what to expect from the university.

The Cal Poly website should contain a section devoted to each successful patent and a section containing information about each patent and its application. This section can also provide information on potential licensing availabilities. There should also be a section pertaining to the patent filed, the background information, facts about the invention, and advantages to the invention.

The staffing of the Office of Technology should also be increased. Other universities have between five to ten personnel on staff. Cal Poly's Office of Technology currently lies on one person – Jim Dunning. Cal Poly should hire student aides to help at the office. A student can be also hired to update and maintain the website. Students would also be encouraged to collaborate with the university to provide input to the policy makers. It is crucial for the students and the university to be able to understand each other. This will provide a smooth process and willingness to engage in such a project.

### **Provide Seminars**

The second solution is for Cal Poly to provide seminars to their students. These seminars should provide information regarding patents and intellectual property and build student awareness of potential opportunities. Information on past experiences should be presented to the student body. Guest speakers should also be encouraged to participate and share information to the students. Current and future endeavors could also be shared during the presentations. Clubs on campus should also be started to increase awareness. This should increase the enthusiasm in the program and inspire students to patent their inventions. Another idea is to provide students with college credit by taking a course that helps them with the patent process. This course could be an elective or even could be a substitution for their senior project class.

**Handouts**

The final suggested solution is to create handouts for students to view. The Cal Poly Office of Technology should be included on the handout along with the website for additional information. Frequently asked questions should also be on the handout. A flowchart should be included showing the necessary steps in obtaining a patent. The steps should include the process of ensuring that the invention is indeed patentable and fits the unobvious and novelty requirements. Teachers should be given copies of the handouts so that they can give it to students who inquire for more information regarding patents and intellectual property. This will in turn, cause students to be more aware of the process and be more inclined to use the Office of Technology.

## **CHAPTER IV**

### **DISCUSSION**

The purpose of this project is to provide students with both a better method for, and knowledge of obtaining protection for intellectual property developed while at University. Due to the small, virtually non-existent staff size of the California Central Coast Research Partnership (C<sup>3</sup>RP), Cal Poly's office for the commercialization of technologies; both students and faculty alike are left with very little, if any information regarding the process of intellectual property protection and its subsequent commercialization. As stated previously, there are several solutions that could effectively assist with informing the student body of this process, in addition to providing information on the how's and why's of the process. The solutions determined to be most effective are 1) increase the staff size of the office of technology transfer 2) providing seminars to both students and faculty informing them of the process and available opportunities 3) creating and providing a handout that could be passed out to all appropriate faculty for distribution to students in classes that could result in the production of intellectual property. This chapter will then discuss each alternative, tabulating the advantages and disadvantages of each.

#### **Advantages and Disadvantages**

##### **Increased Staff Size**

Through increased staffing at C<sup>3</sup>RP, Cal Poly's office of technology transfer, the process of technology commercialization could be greatly improved. Currently Cal Poly's office of technology transfer works jointly with C<sup>3</sup>RP. C<sup>3</sup>RP's dedicated staff consists currently of 1

employee. C<sup>3</sup>RP is a research partnership that aims to facilitate the collaboration of Business/Industry and Cal Poly. C<sup>3</sup>RP's goals as stated on their website are as follows:

- Strengthen relationships between Cal Poly and industry, and build new relationships where opportunities exist for collaboration
- Enhance the competitiveness of companies working with Cal Poly by applying university expertise to the development of commercially viable research, products and technology
- Create opportunities for industry to take advantage of the deep reservoir of technical expertise in the Cal Poly faculty
- Provide enhanced access for business to faculty researchers, laboratories, facilities and students
- Create opportunities for entrepreneurs to start companies and established businesses to grow by engaging with the university
- Enable Cal Poly students, faculty, and spouses to find well-paying, interesting job opportunities in clean industries in San Luis Obispo County.

An organization like C<sup>3</sup>RP is necessary for any and every university. Beyond these goals C<sup>3</sup>RP aims to develop a technology park that would assist in their goals here in San Luis Obispo. While C<sup>3</sup>RP and its goals aim to develop new research and technologies, it is clear that very little focus is aimed toward the subsequent commercialization of these new technologies through protection and licensing. Technology transfer offices on the small end tend to be comprised of 3-5 employees, on the large end upwards of 60 employees. With C<sup>3</sup>RP having to juggle all these tasks plus the office of technology transfer, a staff of one is clearly not sufficient.

By bringing on additional staff C<sup>3</sup>RP would be able to accommodate all facets of its scope. Furthermore, if a portion of that increased staff were able to focus exclusively on technology transfer, it is possibly that Cal Poly could begin seeing better results. These results would be an increased awareness of the office itself, more patents obtained per technologies developed, and increased revenue resulting from additional licensed technologies.

After researching other Universities, in particular those whom license technologies developed at their University successfully, a large staff size was not the only correlating factor to success. That being said, it must not only be an increase in staff size, but also a more informed staff on the subject of the technology transfer or commercialization. The staff must, while each holding specific roles, be able to handle or at the very least understand the roles and procedures associated with each job. The ability of each staff member to handle several tasks enables the staff as a whole to accomplish more. An effective way to increase staff size without greatly increasing payroll would be to hire students whose major is directly associated with technology commercialization. These majors would include but not be limited to Business Administration, Entrepreneurship, Industrial Technology, Engineering, and some Sciences. These students would gain hands on experience that could be applicable to jobs they would encounter post education. Obviously, the students would need to be led by members of staff who have technology commercialization experience.

With increased staff the offices website could be updated to incorporate much of the information necessary to inform students and faculty of intellectual property protection. C<sup>3</sup>RP's current website is not only difficult to locate, but more importantly difficult to navigate. The information regarding the commercialization of technology is clearly not the focus and as a result is difficult to find. Without knowing what to look for the average person perusing the website for information would be lost, and would more likely leave before finding the desired information. Through the increasing of an informed staff and updated website, both faculty and students could be informed of not only the office of technology transfer, but also the opportunities provided to them through this office while at Cal Poly.

### **Open informational seminar**

As requiring that Universities begin mandating a class be taken explaining the concepts of technology transfer in a university setting would take years to accomplish; offering a series of open seminars could educate students and faculty alike. The seminars could cover a wide variety of information; from patent basics and how to perform searches for prior arts, to the location of



the office of technology transfer and the current staff. These classes could be taught by staff members in the office of technology transfer or other informed Cal Poly faculty. Currently both students and faculty are vastly under informed on this topic. As a result both students and faculty might not pursue protection and commercialization of developed intellectual property. By not doing so, both University and the individual miss out on opportunities for both monetary benefits, as well as educational and career improvement.

These seminars, while not required, could increase awareness simply by making such information available. These seminars could be advertised through fliers posted around the university as well in classes and university sponsored clubs. In addition, hosting several of these seminars per quarter would allow attendance by more students and faculty according to their availability. The cost of such a meeting would be relatively low as the only resources truly necessary hold these meeting would be an available staff member and an available room in which to host the meeting. These meetings could also additionally inform students and faculty methods and practices incorporated at other universities. Following the seminar would be an open forum for questions and comments that would provide feedback that would enable Cal Poly and C<sup>3</sup>RP to better improve its process. C<sup>3</sup>RP would then be able to address these concerns and resolve areas important to both faculty and students.

Some of the disadvantages of these seminars would their lack of requirement and possible lack of advertisement. As these seminars could not be required, the question arises as to the ability of staff associated with the seminars to draw people into the seminars. Without successful advertisement these seminars would serve very little purpose due to lack of attendance. These seminars would further stretch the already overworked staff of Cal Poly's office of technology transfer. As staffing of the office is already short-handed placing additional requirements on the staff could lead to less time being available for other greater importance functions.

### **Handouts with applicable information**

Another option that could be pursued would be to create a handout for student and faculty use that could be distributed throughout the University. This informational handout as exemplified above would include all applicable information pertaining to technology transfer and commercialization within the scope of a university. Similar handout are created and passed out frequently informing students of opportunities and clubs available. The handout would serve a dual purpose both as a way to disseminate information to the student and faculty while simultaneously reducing the need for the office of technology transfer to occupy staff with simple informative duties.

As this informational handout would be accessible to all students and faculty, a greater distribution to the student body and faculty could be achieved. Topics covered on the hand out would include location of the office of technology transfer, phone numbers and other necessary contact information, general information pertaining to patents, patent prior art searches, and a flow-chart of the university patent process.

Some limitations of the informational handout would include limitations on the amount of information that could be provided on the handout and the risk of students and faculty disregarding the handout. The handout should not be longer than one page front and back and with this limitation comes a limitation on the information that could be placed on the handout. Additionally students tend to disregard handouts that are not directly related to classwork. In addition there would be the obvious printing cost accrued as handout would be necessary each quarter as new students take relevant coursework.

<b>Needs:</b>	<b>Increased staff and website improvement</b>	<b>Open Informational Seminars</b>	<b>Informational Handout</b>
Clearly defined literature explaining the difference between intellectual property, inventorship, and patentability.	5	4	4
Standardized overview of both student and university rights pertaining to student generated material	5	5	4
Information pertaining to how students can research current intellectual property relating to their idea	5	5	5
Determine several methods for students and faculty to gain knowledge regarding technology transfer in the university setting.	3	3	3
A informational handout containing information about the transfer of technology at University.	4	4	5
A current summary or overview of other Universities that have successful documentation and processes for students to follow.	2	3	2

## **CHAPTER V**

### **Conclusions**

The main goal of this project was to develop a path for University students to both follow and use while obtaining an education at California Polytechnic University, San Luis Obispo. Other Universities have been reviewed and evaluated throughout the nation, and have provided students up to date methods and practices to gain intellectual property protection. The solution that this report offers is intended to enable students to successfully translate work and projects created while at Cal Poly, that can be defined as innovative and unique property, into patents and other protected material to the benefit of both student and University. With this proposed solution, students will be able to leave Cal Poly with a tangible sense of accomplishment not only obtaining their degree, but also with something that they can use to better obtain employment in a difficult job market. The proposed solution should simultaneously contribute to the improvement of Cal Poly. Through this project Cal Poly can give to students' opportunities beyond an education, opportunities that will extend beyond its wall and into the careers and lives of its students. The amount of patents and other protected property created at the University level has grown exponentially over that past several decades. This project will enable Cal Poly to take part of this continuing trend.

This project covered current trends and processes used by other Universities. This report explained to whom these protections are available and what the associated protections are. The report also included definitions of these different protections, as well as to what, each one is applied. It covered the processes in place at other Universities, in addition to Cal Poly's current Intellectual Property Policy. This project created a path for students to follow to obtain

protection for their individual intellectual property. Just as the protections afforded are unique in nature, so too are the students inventions. With this in mind, this project created a rough outline and not an exact step by step process for the protection of material. In addition, students must understand that the obtaining of a patent or other protection is a long process, years and not weeks. As such, the students must understand that a significant amount of work on their part is expected and therefore is also up to them to determine the amount of time this process will take. This project contains a way for students to access the necessary information required. Obtaining protection requires a lot of research regarding what has come before, this project therefore cannot give students that information, rather, it can simply guide them in the path to finding that information.

### ***Patent it Yourself***

According to *Patent it Yourself*, a patent is a legal document granted by the government that protects the owner (which can be an inventor, person, or business) with exclusive rights of using, creating, or selling that invention. A patent can be sold by the owner and the owner can also give permission to other parties to use the invention. Anyone can file for a patent as long as they are the sole inventor. There are three types of patents that can be filed. These include: utility, design, and plant patent. The invention must satisfy “novelty” and “unobvious” requirements. One of the first steps in acquiring a good patent is to document as much data as possible.

Before a patent can go further in the patent process, one must first know if the invention is legally patentable. Once the invention has been fully documented, prototyped, and tested, it is crucial to evaluate the invention for salability. A patentability search is a crucial step in acquiring a patent. Although the patentability search process is a crucial step in obtaining a patent, it is not always necessary. If the invention created is in a new or arcane field, it is most likely a waste of time to do a search.

There are two ways to performing a patentability search. The first way is to do the search personally. The second way is to hire a professional to do it for you. There are three possibilities to perform the patentability search personally. The first way to search is to go to the Patent and Trademark Office (PTO) in Arlington, Virginia for the most complete and thorough search. If this is not a feasible option, one could search any local Patent and Trademark Depository Library throughout the country. The last option to perform a patent search is to do a thorough computer search.

There are three different ways to hire a professional to perform a patentability search. A lay patent searcher, a patent agent, or a patent attorney can be hired to perform the search.

### ***Global Intellectual Property Law***

By restricting imitation Intellectual Property Rights arguably raise the cost of the new technology and restrict its availability. Intellectual Property Rights (IPR's) inherently embody a policy conflict between the objective of providing an incentive to technological innovation and the objective of encouraging the rapid diffusion of new technology and the accumulation of technological knowledge. IPRs are generally a matter of national jurisdiction (i.e. the protection offered to an innovation is governed by the laws of the nation in which the innovation is made, used, or sold.)

Infringement, which refers to the transgression of a legally recognized right that is usually litigable in the courts, is the term generally used in relation to the violation of most forms of intellectual property rights, except for trade secrets, in which case violation is termed misappropriation. Piracy, although not a legal term of art, refers primarily to unauthorized reproduction for commercial gain of literary, musical, artistic, and other copyright works. Counterfeiting is a term used most often to refer to unauthorized duplication of a products trademark to give a similar appearance to a specific product.

### ***NCGE***

According to the National Council for Graduate Entrepreneurship, there has been an increasing number of higher education students involved with entrepreneurial activities and new ventures. Intellectual property issues however, can prove to be a major hindrance to the process. It is also possible for students to develop a negative perception of the university if the university appears to be involved for financial benefits solely. This is why it is important for the university to create a well managed and student-friendly policy that can be easily read and understood.

Of course, the quality the student will experience depends on the university, it is suggested that the NCGE develop a strategy to approach to influence policy makers, educate the educators, and develop future entrepreneurs. It is encouraged to influence policy makers, educate technology transfer, and promote further projects.

### **University Findings**

This project has helped create a more viable way for students to transform their ideas and products into legally protected material both they and the university can benefit from. To do this, an extensive literary search of current methods and processes used by other universities and institutions of higher learning has been conducted. The policies and processes that other universities have implemented and use to date have been researched. The findings of this project shows that there is not one set right way to go about defining the process, but rather many different ways to share the information to the students. Based on this research, it is apparent that other universities share the same problem of not having a clear and concise way to inform students of their policies and processes. However, some universities have a better system than others, so suggestions were made based on these findings.

## **Potential Problem to Solutions**

As stated previously, the Office of Technology website at Cal Poly is quite insufficient for student use. The website is quite confusing and information is very hard to find on it. Searching the website often provides few helpful results. There is a major need for restructuring and reorganizing the website.

Research was conducted by first looking at other universities' websites to see what worked for them. Some of the ideas were used from these websites and were developed into viable solutions for Cal Poly. If the website is easier to use and navigate, there will be an increased flow of traffic to the website which will increase the awareness of the students and faculty. This will hopefully make the patent and intellectual property process much smoother and easier to accomplish.

This solution can only be accomplished with the willingness of the Office of Technology and accompanying staff. If the school is not willing to accept this change, there will be no change and the old system will remain. Students will continue to be oblivious to the potential opportunities that Cal Poly can provide. Cal Poly will also suffer from the lack of innovation and creativity by its students.

There are potential problems to the solution of providing seminars. One problem could be that there is a lack of support from Cal Poly. Funding can be an issue as well. Another potential problem that might be faced is that there could be a lack of interest from the students.

The last potential solution that was developed was to create handouts that students could view and use. These handouts would include a frequently asked questions section and step by step guide for the patent and intellectual property process. Potential problems with this solution



depends how willing faculty would be willing to help pass them out. Another problem is that students would need to know where to find the handouts.

### **Future Work and Direction**

The next step for this project is to implement its findings. Someone will need to take the initiative to improve the website. The policies and procedures need to be updated as well. It would be extremely helpful if a student did a run through of the process to ensure all the steps were sufficient and complete. It would be extremely helpful if faculty members were supportive of the project to help increase the awareness of the process. Increased funding for the Office of Technology would be essential and increasing the staff would also be a benefit. Students would then be able to talk to advisors in order to start the process.

## CHAPTER VI

### References

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## APPENDIX

# Example: Cal Poly Office of Technology Transfer Informational Handout (Front Side)

**C<sup>3</sup>RP Project Administrator: Jim Dunning**

**Location: California Polytechnic University San Luis Obispo, Building 38 Room 101**

**Phone Number: (805)756-5551**

**Email: [jdunning@calpoly.edu](mailto:jdunning@calpoly.edu)**

### What is an Invention?

An invention is a new and useful process, device, article of manufacture, or composition of matter, or a new and useful improvement upon one of these.

### What makes an invention patentable?

An invention is potentially patentable if it satisfies all three of the following:

- **Novelty:** The invention must be novel, i.e., new and original. An invention cannot be considered novel if it has been known, used, published or patented by others anywhere in the world before the date the invention was made by the applicant.
- **Non-Obviousness:** The invention must not, at the time it was made, be considered obvious to a person of "ordinary skill" in the field of the invention.
- **Utility:** The invention must be useful, i.e., it must have a practical application.

### What can you do to improve chances of obtaining a patent?

You can significantly improve the chances of obtaining a patent by following a few simple rules. It is essential to maintain a detailed written record of your experiments in such a manner as to enhance the probability that your research results may be patented and will withstand challenge over the long term. Your written records will become the most important documentation of your work and are essential to establishing a strong and enforceable patent. Seemingly minor errors or omissions that make your notes ambiguous or incomplete may one day jeopardize your patent or patent application.

**Please contact any of our staff at Cal Poly Technology Transfer if you have any questions.**

## Example Intellectual Property Flow Chart (Reverse)

