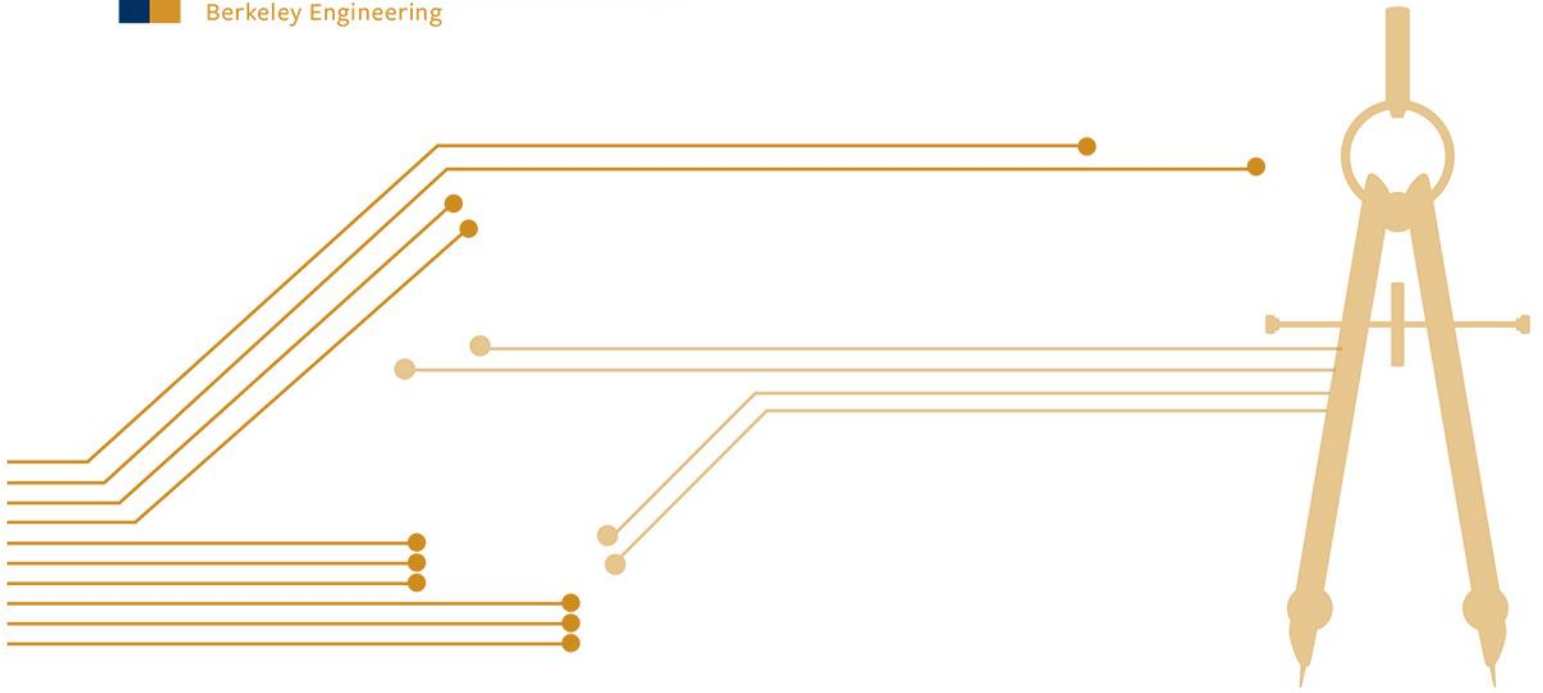




Pantas and Ting

Sutardja Center
for Entrepreneurship & Technology

Berkeley Engineering



NX^{pro} Ski Binding Plate

An Attempt at Commercialization

MTI Program 2016

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This work was created in an open classroom environment as part of a program within the Sutardja Center for Entrepreneurship & Technology and led by Prof. Ikhlaz Sidhu at UC Berkeley. There should be no proprietary information contained in this paper. No information contained in this paper is intended to affect or influence public relations with any firm affiliated with any of the authors. The views represented are those of the authors alone and do not reflect those of the University of California Berkeley.



The Product and Project

Alpine skiing is a fun, and exciting sport. However, it can be dangerous, and alpine skiers are prone to injuries. The most common serious injury in alpine skiing is a torn anterior cruciate ligament (ACL). Over 25,000 people will tear their ACL on the ski slopes of America every year. The problem stems from the stiff ski-skier interface which effectively transmits both control loads and injurious loads between the ski and the skier.

A professor at Worcester Polytechnic Institute, in Worcester, MA, had been developing ski binding concepts which had the potential to protect the ACL. In 2013, a student in the professor's lab patented a new and innovative ski binding plate to filter out injurious loads from the loads transmitted to the skier from the ski. The student left WPI in 2014, however, he continued to develop the technology, and created a company in the spring of 2015 to attempt to commercialize the product.

Market research was conducted to determine the feasibility of commercializing the technology. To conduct primary market research an online survey was created, which 129 individuals responded to. Of the survey participants, over half were advanced recreational skiers, and roughly a quarter were competitive skiers. A full break down of the survey participants can be seen in Figure 1.

What type of skier best describes you?



Figure 1: Survey participants

In the survey, the participants were asked a number of questions including where they skied, how often they purchased equipment, would they purchase a new piece of safety equipment, and if ACL injuries were a concern to them. When asked if they would be willing to purchase a new safety device, most skiers responded that they would, Figure 2. The groups which seemed to be the most enthusiastic about a new device were the competitive skiers and the advanced recreational skiers. This makes sense as these skiers are the most well educated in skiing, make up the core of the skiing population, and are responsible for most of the ski equipment industry's revenue.

% Who Would Purchase Injury Preventing Device

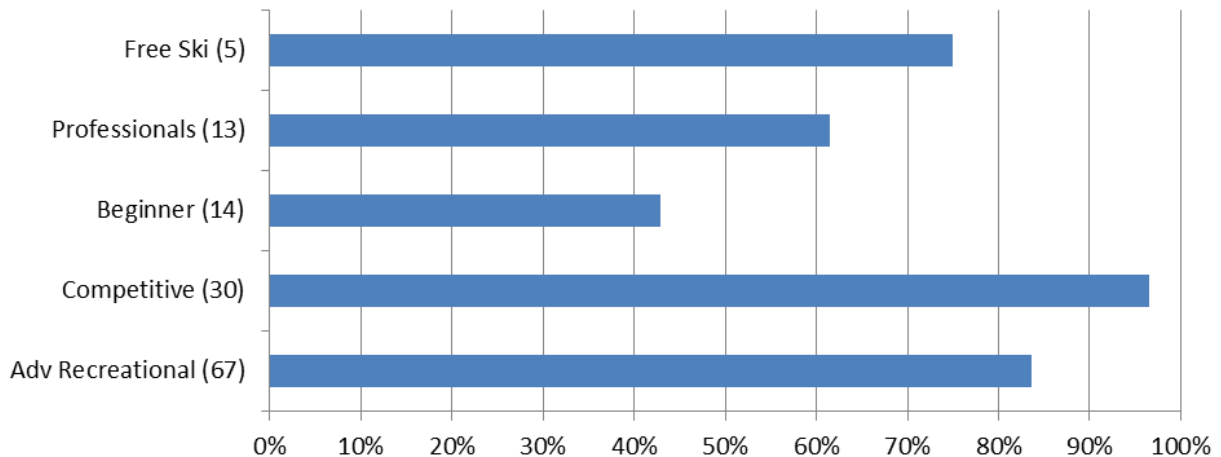


Figure 2: Percent of skiers who would purchase a new piece of safety equipment

State of Project at the end of Fall Semester 2015

At the end of IEOR 298 in 2015, the product was presented before the individuals following the class through the year. Information regarding the market, the product, and financial opportunity were presented. It was decided by the student, and confirmed by the viewers, that the best path forwards would be to attempt to partner with an existing manufacturer to bring the concept to market.

Production of a Functional Prototype

The student had built 4 different prototypes of the product through the years to investigate how different mechanisms would operate, and to get a feel of the potential a device would have. These prototypes assisted in demonstrating the functionality of the device to outside individuals, as well as aided in the development of the product. However, none of them could be skied on. At the end of the class last year the student set out to build a functional prototype with the goal of skiing on it before the next semester started.

The prototype (Figure 3) was completed one week before the start of the semester, and was tested that weekend. The device performed well, and fulfilled all expectations. Several skiers on the slopes were questioned about how they felt about knee injuries, as well as what they thought of a device which would help to alleviate injuries. The most enthusiastic skiers were skiers who had been skiing for over 5 years, and were of highly advanced level. Skiing professionals (ski patrol, instructors, and mountain workers) showed considerable interest, citing that knee

injuries are a concern for them as it could have a direct impact on their ability to work.

Of the 27 skiers surveyed on the slopes, 6 were seen as highly interested in the product (not only showed interest but also asked questions regarding the product), another 10 showed some positive interest. Of the remaining 11 skiers, only 1 skier said that they would not be interested in such a product. Many skiers in the group were of a beginner level, and were ambivalent to the product's existence.



Figure 3: Prototypes mounted onto skis

Creation of Marketing Materials and Contacts

During the testing of the product, videos were taken showing skiers' reactions to the product, how the product operated, as well as how the product performed while skiing on it. These videos were compiled into a 5-minute video to send to existing ski equipment manufacturers. The video was posted privately on YouTube, and links were sent out to prospective contacts.

A standardized email was drafted and customized for each individual, and can be seen in Appendix 1. This email was sent to contacts at various companies who were made via LinkedIn. The cold emails were surprisingly effective, and a response rate of between 5 and 10% was achieved. Responses were gotten from all but one of the major manufacturers of ski bindings, and responses were also received from contacts at skiing-related companies. A list of companies whose responses were received from can be seen in Table 1.

Table 1: Companies contacted

Company Contacted (response Received)	Company product
Marker-Voelkl	Skis, ski boots, and ski bindings
Tyrollia	Ski bindings
Atomic	Skis, bindings, and boots
Fischer	Skis
Red Bull	Extreme athlete sponship
Head	Skis
J. Kenneth Sowles Athlete Management	Athlete management

Responses from Companies

Marker-Voelkl

The marker group showed the highest interest in the product of any manufacturer. Through emails, the VP of North America operations was contacted, the highest standing individual contacted. This contact took the information to the company wide mid-winter meetings in Europe to get an answer regarding collaboration on the product. After the meetings, he declined the pitch, citing poor skiing markets and warm winters in recent years stifling any R&D development in the company.

Tyrollia

Two individuals in charge of technical development of bindings were contacted at Tyrollia. After many exchanges, the two dismissed the product, citing that they did not believe it would have a positive impact on knee injuries, and that the company was already committed to several R&D projects and could not commit to any more development.

Atomic

A contact at Atomic was already know, and is the director of Research and Development at Atomic. This individual has already known about the technology from previous conversations, and even though the technology has seen marked improvements, was still uninterested in pursuing a collaboration.

Red Bull

Red Bull is a manufacturer of energy drinks, however they sponsor many extreme athletes and a number of high profile skiers. I was put in contact with an individual in charge of winter sports in north America, who was an ex US ski team freestyle coach. He was interested in the device, but through his internal conversations stated that Red Bull was not in the business of product development.

J. Kenneth Sowles

J. Kenneth Sowles athlete management has many of the USA's best skiers as their clients. They were contacted with the hopes of conversations leading to their athletes. A contact to one of their athletes, an Olympic medalist, was received.

Next Steps and Outcome

Though the product is innovative, and has potential to positively impact the safety of alpine skiers, the industry is reluctant to invest in the technology. Manufacturers state that poor markets and winters have had a negative effect on their ability to invest in new R&D projects. Other manufacturers are going in different directions and are not interested in the technology.

It is not the desire of the ones involved to continue to go it alone with the project. It is poor timing for the lives of the individuals, and they do not have the resources to continue. The individual(s) involved will continue to contact athletes who may have influence over the manufacturers in their spare time, as well as continue modest developments, and enter one competition this summer. However, market forces, as well as manufacturer's perceptions and strategies have placed serious commercialization of the technology on hold.

Appendix 1: Sample email

Subject: Ski Binding Plate - Important

Body: Hi **NAME1**. My name is John Madura, and I got your email address from **NAME2**. I'm a PhD engineer at UC Berkeley. Over the past 4 years I've been working on a ski binding plate designed to stop ACL injuries in alpine skiing. After a lot of work, I now have some functional prototypes which are only 15mm in height, and have the potential to greatly reduce the probability of suffering an ACL injury. The device poses no negative impact on the skiing experience.

As I'm sure you know, ACL injuries are the most common injuries we see in alpine skiing, and there are very few products out there today (really no products) which can prevent the injury. The technology I've developed operates on different principals than traditional bindings, and reduces the chance of inadvertent release as well as protects the skier from injury.

I strongly believe that this technology is applicable to the entire alpine ski market, from advanced ski racers, to beginner skiers, to the elderly. I believe that it's adoption could lead to increased market share, as well as an expanding market, as skiers who have previously stopped skiing for fear of injury see the product as a way to get back onto the slopes.

I am at the stage now with the technology where I am looking to partner with a manufacturer to help bring the technology to market, and make skiing a safer, more enjoyable sport. **COMPANY** has been at the forefront of recent binding innovations, and would make a great partner. This is a new technology, which has never been seen in the market before.

Please feel free to contact me at this email address or at **1-XXX-XXX-XXXX**. You may also forward this to anyone in your organization who may be interested.