

# Accelerating Technology Commercialization:

University of Akron (Ohio) using the NSF I-Corps Model

Gopal Nadkarni<sup>#1</sup>,

*Innovation Practice Center, University of Akron  
411 Wolf Ledges Pkwy,  
Akron, Ohio, USA 44311*

<sup>#1</sup> gopal.nadkarni@uakron.edu

Elyse Ball<sup>\*2</sup>, Daniel Hampu<sup>\*3</sup>

*University of Akron Research Foundation  
411 Wolf Ledges Pkwy,  
Akron, Ohio, USA 44311*

<sup>\*2</sup> eball@uakron.edu , <sup>\*3</sup> dhampu@uakron.edu

**Abstract**—The paper explores the new technology commercialization model being followed at The University of Akron (UA). UA has implemented the National Science Foundation (NSF) Innovation I-Corps™ model since 2013. This paper describes how the NSF I-Corps model has changed the innovation culture at UA and allowed the academic faculty to explore the business potential of their intellectual property. Differences in implementation across several I-Corps Sites are explored. The lessons from UA's experience show that the I-Corps Sites program has been a resounding success and helped faculty and students to become more entrepreneurial in exploring the commercial value and demand drivers of technologies invented at UA.

**Keywords**— *University of Akron, I-Corps; NSF, University; Technology, Commercialization; Startup; Spinoffs; Mentors; Entrepreneurship; Proof of Concept; Customer Discovery*

## I. INTRODUCTION

The commercialization success rate for inventions and technologies arising out of university research varies widely, and in most universities, the channels to move from invention to commercial success are not well established. The reasons for this low success rate range from faculty emphasis on research and teaching to a poor understanding of how to create a business model based on a validated customer need. West has shown that given the billions of dollars spent on university funded research the yield is low. As an example, in 2010, approximately \$90b of federally funded US research generated only \$2.5b, a less than 3% return in the form of fees, licensing deals and royalties [1].

In addition to direct revenue generation, many universities create avenues for entrepreneurial faculty to create new ventures, in the form of startups (also called spin-offs). While entrepreneurship is still one of the main driving forces of the U.S. economy, the mechanics of forming and running successful startups is not a well-established science. The prevailing opinion is that business schools teach people to run smaller versions of larger companies, which is not representative of how startups function [2].

Several notable serial entrepreneurs have been active in exploring the causes of startup failures and attempting to find

proper methodologies that will make such startups viable especially from universities. The National Science Foundation (NSF) is active in encouraging universities to adopt these methods in the hopes of improving the success rates for technology commercialization using tools such as the Business Model Canvas popularized by Steve Blank [2]. Several NSF programs have been built to leverage the power of teamwork to accelerate innovation. These programs seek to commercialize university research through sharper market focus, instilling a culture of entrepreneurship and the creation of a cadre of successful innovators and business mentors.

## II. THE UNIVERSITY OF AKRON

The University of Akron (UA) is a public research university in Northeast Ohio with approximately 28,000 enrolled students in arts, law, sciences, health, education and engineering disciplines. In particular, UA's School of Law, College of Engineering, and College of Polymer Science and Polymer Engineering have gained international recognition for the quality of their education. The College of Engineering has been among the four fastest growing programs in the nation over the past decade. With more than 3,000 students, the graduates of the College of Engineering are well respected and the quality of its industrial co-op program is excellent. The College of Polymer Science and Polymer Engineering is nationally recognized and is among the top five in the world. The School of Law is regularly ranked among the nation's best value law schools and has widely regionally recognized intellectual property program.

### A. Technology Commercialization

Despite being a smaller research institution with an annual research budget of about \$60 million, UA has a significant pipeline of about 400 active, pending and provisional patents, including many patented technologies within advanced materials, medical, sensing, and software applications. UA's Office of Technology Transfer receives about 100 invention disclosures per year. UA has received national recognition for its technology transfer successes, including being ranked #1 in the world in patents issued per million research dollars in 2000 to 2004 by the Milken Institute, receiving the University Economic Development Association's 2007 Award of Excellence in Technology Commercialization, and winning

the inaugural U.S. Economic Development Administration's National i6 Challenge in 2010 in collaboration with Austen BioInnovation Institute in Akron. UA also has infrastructure in place to provide continued support to technologies that have shown significant commercial potential. In 2001, the UA Office of Technology Transfer helped establish the UA Research Foundation (UARF) as the exclusive commercialization lead on all UA technology license opportunities. UARF is tied into Northeast Ohio's entrepreneurial ecosystem through its participation in area angel groups, seed funds and entrepreneurship support organizations. UARF also engages Senior Fellows, former industry executives and entrepreneurs who now volunteer their time mentoring new technologies and companies from all technology areas and assist in the commercialization of UA technologies [3].

### B. The Invention-Commercialization Paradigm

Prior to 2013, UA followed the conventional technology commercialization model (Figure 1). In this model, inventors

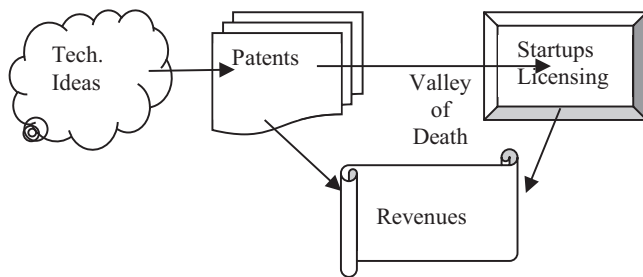


Figure 1 Technology Commercialization Model used prior to 2013 with an illustration of the Valley of Death after patenting and before successful start-up formation or licensing for revenue generation.

would seek the assistance of the Office of Technology Transfer, who would advise them on protecting intellectual property, file provisional patents as well prosecute patents. The number of invention disclosures filed was taken as a good indicator of the health of research working on potentially useful “commercializable technologies”.

However, licensing technology from intellectual property generally was a hit or miss affair and, except in rare cases, did not result in satisfying conclusions (licensing, royalty deals or other follow-on funding). Also, UARF and its senior Fellows actively engage in helping faculty entrepreneurs, and multiple startups had been formed with the intent of commercializing UA technology. However, most of these companies have struggled to make progress. The problem that became apparent is familiar to venture capitalists: investor confidence in a patent or idea was lacking unless there was an established prototype supported by a strongly validated business model that placed emphasis on documented customer need and a credible company management team.

Since 2009, the UA's Office of Technology Transfer has been highly successful in communicating that faculty ideas have commercial value and bringing in an increase in the number of disclosures and patent filings. In fact, the number

of filings has doubled with the doubling of the research federal funding that UA has attracted. Hence, there was all the more urgency to try a fresh path to improve the success rate of revenue generation through new models.

West points out that universities should provide help to faculty members on how to market products, incorporate companies, and attract venture capital, since inventors have little background in commercializing their ideas and building businesses [1]. In fact, Rasmussen et. al studied initiatives to promote commercialization of university knowledge and concluded that the challenge is to fund arrangements to link teaching, research and commercialization, making the latter a positive contribution rather than a load on the others [6]. Hence, two new UA efforts address these multiple issues through the programs outlined below.

### C. New Initiatives to Bridge the Valley of Death

In 2012 UA embarked on a strategy to help resolve the commercialization dilemma with a proposal to bridge the valley of death (Figure 2) through two related programs (i) NSF I-Corps Sites and a (ii) Proof of Concept Initiative which has been modeled after the Deshpande Center for Technological Innovation at MIT. This Proof of Concept Initiative has been funded, staffed and up and running since March 2014 with the arrival of a seasoned industry entrepreneur to direct the commercialization efforts.

The Proof of Concept Initiative aims to accelerate the pace of commercialization of UA technologies by focusing on a few technologies deemed to have the highest commercial potential and driving their development [8]. The Proof of Concept process forms teams, comprising of a faculty member (Academic Lead), a graduate student or postdoc (Entrepreneurial Lead), and a Mentor from outside of UA, and gives them an opportunity to apply for proof of concept grant of up to \$50,000 to fund prototyping, testing and market research. Funding early stage technologies through the Proof of Concept Initiative is primarily a de-risking strategy. This allows UA to quickly determine whether to pursue the invention, with the hope of a revenue stream coming from licensing, royalties or follow-on funding. While it is by no means a sure fire strategy for creating successful businesses, this de-risking strategy has helped raise the probability of improved follow-on funding, as well as increased the rate of

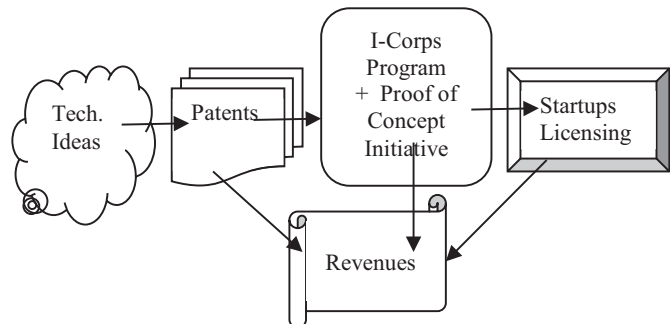


Figure 2 New Technology Commercialization Model using I-Corps and the Proof of Concept Initiative effort to help bridge the valley of death for early stage ventures.

deal flow, in several U.S. universities that follow this model.

However, the Proof of Concept Initiative to fund good projects requires faculty to be familiar with established business concepts such as value proposition, market feasibility, addressable market size, and customer discovery and validation. This is where the NSF I-Corps Sites model is invaluable as a precursor program to help train and motivate faculty on the risks and rewards of the commercialization pathway. It helps faculty discover whether a business exists from the perspective of documented market need. Faculty who graduate from the I-Corps program are better equipped to apply for follow-on funding programs like the LEAP (Leading Entrepreneurial Academics into Practice) program funded by the Proof of Concept Initiative at UA.

### III. THE NSF I-CORPS MODEL

The NSF is a federal agency created to promote the progress of science. It is the only federal agency whose mission supports all fields of fundamental science and engineering. NSF has developed program called I-Corps, which “prepares scientists and engineers to extend their focus beyond the laboratory and broadens the impact of select NSF-funded, basic-research projects.” [4] It starts with I-Corps Sites, which provides “infrastructure, advice, resources, networking opportunities, training and modest funding” and prepares teams to apply for the more rigorous I-Corps Teams program [5]. Promising I-Corps Sites teams are among those selected for participation in I-Corps Teams. The topical focus of a project must be in an area of science, technology, engineering, or mathematics (STEM) normally supported by NSF.

In June 2013, NSF announced that UA would be one of the three locations chosen for its NSF I-Corps Sites Program from a slate of competitive proposals across the US. These locations were designated with the goal to educate faculty, students, and the community on entrepreneurial principles and to answer important commercialization questions directly applicable to state and federal grant programs.

The initial funded sites across the US were at the University of California San Diego, University of Illinois Urbana-Champaign and the University of Akron. Sites were funded at academic institutions that already had existing innovation or entrepreneurial units to enable them to nurture students and faculty engaged in developing technologies. I-Corps Sites program officers provided the infrastructure, advice, resources, networking, training curriculum as well as some funding to develop the teams.

To achieve this goal, each team includes an Academic Lead, an Entrepreneurial Lead, and a Mentor who work together to explore the commercial potential of each technology. Specifically, Academic Leads must be inventors for the technology being studied with an interest to learn the customer discovery and commercialization process. Entrepreneurial Leads are students, typically a graduate student from the Academic Lead’s lab and other students with

varied skill sets, who do much of the I-Corps work. Mentors must have significant industry experience (outside of academia) and help to give their teams perspective on technology development and commercial ventures. Working as a team, the Academic Lead, Entrepreneurial Lead(s) and Mentor learn to verify a value propositions based on potential customer needs. They begin by testing a series of hypotheses specific to each technology through several customer interviews. In addition, program participants learn about intellectual property, technology transfer, market research, and early-stage investing. NSF allowed the sites to have flexibility on how they implemented the Guidelines in leveraging their ecosystem and available resources.

#### A. Comparison of I-Corps Sites Practices

A comparison of the NSF I-Corps grant implementation for three institutions that won the initial awards (TABLE I) is presented below.

1) *University of California, San Diego (UCSD)* implemented its I-Corps Sites program in the Fall of 2013. The program has an Administrator, as well as a seasoned “Entrepreneur-in-Residence.” The program is structured in two phases (Phase I and Phase II), with the most promising finalists from Phase I going on to Phase II to continue the customer discovery and validation phase. Each phase has a duration of 10 weeks, and two programs are run every year. Each team in Phase I receives \$1000, with Phase II awardees receiving \$2000. Teams come in with ideas, and are able to validate their market need through meetings with customers or to build and refine their products. The final presentation is made to mentors, local business people and other friends of the von Liebig Center for Entrepreneurism and Technology Advancement. Various team groupings have attended the program: faculty only teams, graduate student teams and even undergraduate student teams along with faculty/graduate student teams. Projects include Bio-engineering, Nano-engineering and special projects coming out of the Scripps Institute of Oceanography.

2) *University of Illinois, Urbana Champaign* also implemented its first I-Corps Site program in 2013 and has run 4 cohorts with an average of 8 teams/cohort, with 29 teams as of Fall 2014. As at UCSD, an experienced Entrepreneur-in-Residence administers the program and acts as the resident mentor. Teams are also encouraged to bring in their own mentor or business advisor. The program runs over seven weeks, through biweekly classes, and covers basics of the Business Model Canvas, focusing on value propositions and market segments through customer interviewing [4]. The mentor has in-person meetings in between classes to try and maximize interaction and coach the teams through critique and intensive feedback. The other feature that makes it distinctive is the expectation that every team find a minimum of five customers by Week 1. The course is consumer oriented and the funding generally is used by teams to go to trade shows, conferences and travel to visit customers. Creative ways to contact customers, e.g. using LinkedIn, are

encouraged. Teams are usually composed of a faculty, and one or two graduate entrepreneurial leads, with some all graduate student teams. Previous I-Corps participants come in to share their experiences and speak about their continuing entrepreneurial journey to the teams.

3) *University of Akron* received funding in 2013 and has run 3 cycles with a fourth cycle underway as of Fall 2014 with the help of UARF advisors working in partnership with UA Innovation Practice Center. Teams are given \$2500 to primarily help with customer discovery and validation. Projects to “build” products are not encouraged; the focus being on evaluating the commercial potential of UA based

technologies. Faculty/Graduate student teams are paired with matched mentors. Mentors commit to attending the full seven week program and coach the teams. UA has extended its program to other University teams in Northeast Ohio – teams from Ohio State University, Cleveland State, Kent State and Youngstown State have benefited from attending I-Corps programs. Projects come from all engineering disciplines, polymer science and engineering and from applied mathematics, agriculture, computer science and music illustrating the diversity and interest from the UA entrepreneurial faculty.

TABLE I  
INITIAL I-CORPS SITE COMPARISON SUMMARY

	University of California, San Diego (UCSD)	University of Illinois, Urbana-Champaign (UI)	University of Akron (UA)
<b>Duration</b>	Two phases, 10 weeks each	6 weeks	7 weeks
<b>Team Composition</b>	Variety of combinations of faculty, graduate and undergraduate students	Faculty/graduate student teams or graduate student only teams	Most teams have faculty, technical student, business student, mentor
<b>Role of Mentor</b>	Entrepreneur-in-Residence coaches teams. Teams also find their own mentors	Entrepreneur-in-Residence coaches multiple teams as a business mentor	Each team has own business mentor
<b>Funding per Team</b>	Phase I \$1000; Phase II \$2000	\$2000 per team; additional funding available from separate pool	\$2500 per team
<b>Genesis of Teams</b>	UCSD only	UI only	UA and nearby universities
<b>Other Notes</b>	Teams benefit from working out of von Liebig Center	Teams from past cycles are invited back to update and share experiences	Proof of Concept Initiative is source of follow-on mentorship and funding

#### IV. IMPLEMENTATION OF I-CORPS AT UA

In applying to become an I-Corps Site, UA hoped to fill a gap in its technology development pipeline between the roughly 100 invention disclosures it receives per year and the 10 to 20 technologies eligible for Proof of Concept Initiative funding. The I-Corps Site has the capacity to host more than 30 teams per year, teaching them key technology commercialization principles and testing hypotheses regarding a technology’s commercial potential. Each UA I-Corps Sites team consists of an Academic Lead, an Entrepreneurial Lead, and a Mentor, who work together to explore the value proposition and customer segment boxes of the business model canvas by conducting at least 15 customer interviews.

As part of the program, each team is required to attend training and meet with their business mentor. Additionally, each team is eligible to receive up to \$2,500 in NSF funding, which can be used for prototyping materials, travel expenses

to visit customers and end users, training or entrepreneurship education, and miscellaneous expenses. The I-Corps Sites program is an exciting opportunity for professors to learn about entrepreneurship and vet the commercial potential of their technologies, which significantly impacts and improves the quality of future funding requests.

##### A. Weekly Schedule Followed at UA

The schedule implemented for the 7-week program is shown in Table II. Most of the material required to be submitted is available at the UA I-Corps website [7] for download. There is a great deal of preparatory work preceding the actual start of the 7-week program. This includes advertising the details of the program to the academic community, marketing the benefits and answering questions from the faculty on the time commitments required to attend the program, and pitching the program to business and law students whose perspectives are valuable to the team. In addition, once applications are



received, the program administrator finds suitable industrial mentors for each faculty team, which is often the most time-consuming part of the planning process.

TABLE II  
EXAMPLE OF I-CORPS SCHEDULE

<p><b>Week 1</b></p> <ul style="list-style-type: none"> <li>- Sign Non-Disclosure Agreement, Review Budget Form</li> <li>- <u>Lecture</u>: Intellectual Property &amp; Business Model Canvas</li> <li>- Preliminary Elevator Pitch (1 min)</li> </ul> <p><b>Week 2</b></p> <ul style="list-style-type: none"> <li>- Watch Steve Blank Videos on “Business Models &amp; Customer Development”</li> <li>- <u>Lecture</u>: Customer Interviewing Techniques &amp; Technology Transfer</li> <li>- <u>Submit</u>: Intellectual Property Form</li> <li>- Elevator Pitch with Potential Customers &amp; Competitors</li> </ul> <p><b>Week 3</b></p> <ul style="list-style-type: none"> <li>- Watch Steve Blank Videos on “Customer Segments”</li> <li>- <u>Lecture</u>: Testing Business Model Canvas Hypotheses &amp; Market Research</li> <li>- <u>Submit</u>: Competitive Products Form, List of Potential Customer Interviews &amp; Customer Interview Form #0 (3 Interviews)</li> <li>- Elevator Pitch with Value Proposition</li> </ul> <p><b>Week 4</b></p> <ul style="list-style-type: none"> <li>- Watch Steve Blank Videos on “Value Proposition”</li> <li>- <u>Submit</u>: Business Model Canvas &amp; Customer Interview Form #1(5 Customer Interviews)</li> </ul> <p><b>Week 5</b></p> <ul style="list-style-type: none"> <li>- Panel Session: Local Innovators &amp; Discussion on Funding Sources</li> <li>- <u>Submit</u>: Market Research Form &amp; Customer Interview Form # 2 (5 Customer Interviews)</li> <li>- Elevator Pitch with Results of Customer Discovery</li> </ul> <p><b>Week 6</b></p> <ul style="list-style-type: none"> <li>- Presentation Practice Session</li> <li>- <u>Submit</u>: Slide Deck Draft for Final Presentation &amp; Customer Interview Form #3 (5 Customer Interviews)</li> </ul> <p><b>Week 7</b></p> <ul style="list-style-type: none"> <li>- <u>Submit</u>: 3-4 Sentence Value Proposition &amp; Slide Deck for Final Presentation</li> <li>- Final Team Presentations</li> </ul>
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#### B. Lessons Learned from UA’s I-Corps Site

1) *Teams Dynamics*: It was no surprise to discover that engaged and coachable participants are easier to work with, and interpersonal dynamics influence the success of a team. Teams where the faculty member is engaged and coachable have yielded good results because the faculty advocates the importance of the program. When faculty buy in to the value of the program, it trickles through the entire team. The entrepreneurial leads and the mentor seem more engaged in the program when such advocacy takes place. This ultimately leads to stronger entrepreneurial leads from both technical and business backgrounds. Conversely, if Entrepreneurial Leads or Mentors perceive that the Academic Lead is disinterested, the team does not function well. This has been evident when Academic Leads do not participate in the discussion of the program or do not communicate effectively with the team.

Communication is integral to the success of a team. Some teams are wary of discussing the technology too much because they are not familiar with the mentor or the business entrepreneurial lead. When academic leads, mentors, and entrepreneurial leads establish a way to communicate most

effectively, the teams tend to have better results. It is better if the teams are able to meet in person beyond the scheduled weekly meetings because it helps those teams who do not already know everyone in their team. The dynamics of interpersonal relationships can affect how well a team learns and follows mentor guidance effectively.

2) *Mentors*: The UA I-Corps Site administrators focus on business experience as the key element of a qualified mentor. MBAs are preferred over PhDs, because they add a new dimension for the Academic Lead and the Entrepreneurial Lead (almost always a graduate student from the Academic Lead’s lab). The role of the mentor is to help the team recognize and question their assumptions about the market for a technology, including its features, customers, and needs. By converting these assumptions to “hypotheses to be tested,” the NSF I-Corps methodology urges inventors to fully explore and understand the market for their technology before committing to technology commercialization. Mentors are important to this process because they provide an external perspective and they tend to drive focus away from the technology and toward cost, market needs, and the critical actors of product benefits and pricing.

Finding suitably qualified mentors for advanced technical projects can be difficult. UA’s goal has been to try and find entrepreneurs or business people with some experience in the field related to the project, e.g. a business development person in a medical device company would be an ideal candidate for mentoring a biomedical project. These mentors are best positioned to make introductions to market leaders for customer interviews. As an example, one team with a medical technology benefitted tremendously from the mentorship of an attorney with experience working for medical device companies. Using his network, the team got direct access to physicians, who were regional leaders in their field and would otherwise have been very difficult to contact.

However, the goal of finding industry-specific mentors has not always been successful. In that case, experienced business people almost always have the necessary qualities to help with the customer discovery and validation phase. In fact, mentors with little experience in a market or technology often ask their teams more questions, leading to a sharpening of the value proposition and an abandoning of technical jargon to describe the product. One team had a perfect industry-specific mentor, but got their most valuable feedback from another mentor who consistently reminded them that pricing of their product would be the single largest determining factor as to whether it would be adopted.

Mentors can vary in their ability to interact with teams. Many of the mentors have full-time jobs and the I-Corps program strains their involvement, limiting their ability to have in-depth discussions after the weekly meetings. However, UA has recently implemented a project management software tool that will help ease this difficulty and keeps the teams on track. The software is accessible both from the web and on

mobile devices, making it easier for teams to add comments and upload information and photos.

Lastly, mentors rarely serve multiple consecutive cohorts because of scheduling difficulties and general “fatigue” in the program. Some mentors on promising teams have remained engaged, where there is a stronger possibility of forming startups, particularly in assisting their teams as they pursue Proof of Concept Initiative support or other sources of follow-on funding.

3) *Customer Interactions*: For most teams, choosing and contacting 15 potential customers in only 7 weeks is the most challenging part of the I-Corps program. It is hard to develop a list and actually schedule 15 interviews in such a short time span because of the scheduling conflicts of all those involved in the interview, the team members and the potential customer.

The first question teams must answer is “who counts as a customer?” I-Corps defines “customers” as those who will actually pay for a product or service. Customers are differentiated from “end users” who are the final beneficiaries of a product or service. UA’s I-Corps Site allows teams to contact anyone in the value chain, provided the team agrees to focus on a single market segment and teams interview those whose feedback can be tied to validating or invalidating a proposed value proposition hypothesis. As one example, several medical device teams talked to surgeons, patients and hospital administrators related to their technologies, even though insurers would be paying for the device and would thus be the customer. Surgeons in particular were viewed as useful interviewees because they were often the decision makers on which device was used, they understood competitive products, and they could speak knowledgeably about the value of a particular new product feature.

Teams are cautioned against interviewing friends and colleagues they know well, because there would be bias, which could undercut an honest evaluation of the market need the team hopes to fill. In one instance, a team, who were proud of having data from 30 interviews, were seen to have interviewed people in their immediate circle, which did little to substantiate third party validation of a market need.

Sometimes, there is a tendency for the teams to talk too much about the features of their “*technology solution*” instead of focusing on the “*customer need*.” The UA I-Corps administrators caution teams against this practice, and ask them to sharpen their listening skills to help get more valuable insights. A voice of customer module has been added to the UA I-Corps sites program to improve the team customer interviewing skills.

Faculty and graduate students are typically not comfortable conducting interviews either on the phone or in person, which is why much of the program is focused on customer interviewing to help ease this transition. Recently, UA’s I-Corps Site added an in-person practice session and paired teams with “friendly” interviewees (mainly former I-Corps mentors). Both practices aim to help the faculty and

students overcome this barrier, and often work well to rid them of their shyness in interview settings. Another key practice is having the mentor present during the first few interviews. Mentors provide feedback on interview technique to their team, and help the team to look realistically at what happened during the interview and the key take-aways. This becomes all the more important, because there are limited opportunities to interview key customers and walking away without understanding the true need for a customer is detrimental to the team. Quite often, getting a second interview can be time-consuming and cumbersome – or even impossible.

Complex technologies often require significantly more effort to find the right customer to interview. These are typically B2B projects where getting to the right “entry point” in the supply chain is often the difference between success and failure. Hence, teams rely on the networking skills brought in by the mentor to find industries interested to improve their current methods or having a well-defined need. Even with this strong support system, there are certain medical areas, e.g. surgical devices where finding and interviewing doctors, surgeons, and other medical practitioners are extremely challenging.

4) *Panel Discussion*: One of the most popular sessions of the course has been the panel discussion composed of local business professionals and entrepreneurs. The introduction of panel discussion stemmed from feedback from the first cohort of I-Corps participants, who wanted to hear directly from people who have “been there, done that” as entrepreneurs. UA believes that this type of “tacit” mentoring is a key motivator, through story telling of successes and failures. The learnings from such mentors have been valuable as evidenced from the feedback from the I-Corps Sites participants.

### C. Outcomes and Success Stories

In I-Corps Sites’ first year of operation at UA, 32 faculty, 51 students, and 32 mentors have participated in the program. The UA I-Corps Site has hosted teams from four neighbouring institutions: Cleveland State University, Kent State University, Ohio Agricultural Research and Development Center (affiliated with Ohio State University), and Youngstown State University. Mentors have come from such organizations as BioEnterprise, Cleveland Clinic, JumpStart, Ohio Aerospace Institute, Old Oak Partners, OrthoHelix, PreMix, ReQuisite Biomedical, The Sherwin-Williams Company, and The Theken Family of Companies. Two I-Corps Sites teams have participated in NSF’s more intensive I-Corps Teams program, which comes with \$50,000 in funding for technology development. Ten I-Corps Sites teams have won Ohio Third Frontier Technology Validation and Startup Fund awards, raising \$550,000 in funding to support translational research at UA or an affiliated start-up in Northeast Ohio. Seven I-Corps Sites graduates and one I-Corps Teams graduate were among the 10 finalists for the first cycle of UA Proof of Concept Initiative funding.

Two examples of teams with success are illustrated below (names and project information have been withheld):

Example One: A faculty member from the Department of Civil Engineering had patented a new stress sensing sensor. While the technology was potentially disruptive, it was not until the team went through I-Corps training what the value proposition was and who would actually use/buy the technology. A mentor from a global Fortune 500 company served to coach the team intensively. The mentor was so impressed by the program that upon his retirement, he volunteered to work with the UA Research Foundation pro bono, as well serve on other technology commercialization projects. The team went on to compete in other business competitions and recently won a \$50,000 Ohio Third Frontier Technology Validation Award. They subsequently applied to NSF I-Corps Teams; and are in process of forming a company.

Example Two: A team from Applied Mathematics were evaluating a new image processing algorithm. They used their I-Corps Sites funding to attend a conference put on by a major chipmaker, which makes graphics processing units (GPUs). Through the conference, the faculty member made several connections with the customer, ultimately reaching a decision maker who stated that they might be interested in licensing software and clearly specified the performance requirements. The faculty member went on to win the UA Proof of Concept LEAP Awards to begin generating the proof the chipmaker has requested. The team is now working with a dedicated industry mentor to come up with a more robust business strategy and to develop licensing models that are well suited to his technology.

#### SUMMARY

The I-Corps Sites program implementation at UA has been described in detail and compared to implementation at other US universities. While it is shown that I-Corps Sites program serves an educational role, it also serves as a pre-screening process to prove market need for technologies that hope to apply for other sources of translational research funding from private, state or federal sources. The key learnings from the I-Corps Sites program can be summarized as follows:

1. The team approach adopted at UA appears to work well to help vet value proposition hypotheses quickly.
2. UA's method of matching mentors to I-Corps teams has appeared to add considerable value to the projects.

3. The implementation of Business Model Canvas appears to work well for the teams. The initial focus on validating the value proposition and customer development through interviewing is the key learning that teams take away.
4. Teams that have gone through UA I-Corps Sites training have documented successes in follow-on funding that supports marketable technologies.

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