THE RIPPLES PROJECT: EXPANDING THE REACH OF UNIVERSITY RESEARCH

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EXECUTIVE SUMMARY

The academic world has long treasured her independence – academia is seen as an intellectual silo; an oasis of thought and science. This is, in many ways, a necessary, positive, and formative feature of the academic world – transformational thought requires autonomy and distance. Intellectual developments have, therefore, historically had a substantial incubation period; this, too, can be perceived as a net positive – it makes the realm of acceptable science shift more slowly, decreases the frequency of scientific back-peddling, and maintains the long-term authority of academic research.

Often, however, the pace of scientific input in application is exceedingly slow. This is perhaps most obviously true in American politics – there are areas of scientific thought with universal academic consensus, which are yet to be reflected in political conversation. In our national politics, this is, of course, not an information problem – it is, widely, a testament to the power of concentrated over dispersed interests. Yet it seems plausible that facilitating partnerships between academics and public policy-makers on the state and local level, or between academics and business leaders, would make the public and private sectors more responsive to scientific research; this change would amplify academic thought in the pursuit of social progress. In this research project, we sought to uncover insights for how best to expand the reach of university research, in the realms of business and government.

We began by evaluating the concept of a non-profit with the aim of building relationships between academic researchers and public policy-makers. We had conversations with around seventy-five stakeholders – policy-makers, legislators, professors – and came to the conclusions which follow. The stakeholders universally identified a deficiency in academic-government relationships; however, we determined that the pain is not concentrated on any particular stakeholder, so the desire for greater partnership is unfortunately weak. In other words, most stakeholders believe that greater collaboration between academic researchers and public policy-makers would have significant social benefit – but they do not believe that a lack of such relationships is seriously harming their personal interests. Based on this reality, we can not make a significant impact on academic-government partnerships, and instead, shifted our focus to academic-corporate partnerships.

Throughout the research process, we organized a pilot program to identify characteristics of successful academic-government relationships. Specifically, our pilot program sought to connect eight local/state government offices with Carnegie Mellon researchers. From the pilot, we determined that there is greater potential for academic-legislative partnerships that are built around nonpartisan and bipartisan issues. Our pilot program with PA State Representative Rabb is still ongoing.

Our evaluation of the concept of an organization which would build partnerships between academic researchers and companies yielded more promising results. In particular, we received promising feedback from conversations with business executives at Deloitte; they told us that Deloitte might use a service that allows the company to contract out research to graduate students, if the platform were fully operational. They also recommended that we choose mid-market consumer products/services and consumer sales companies as our beachhead market; this is a excellent avenue for future research.

Our conversations with professors, graduate students, and companies also elicited three key concerns with advancing academic-corporate partnerships. First, these relationships take time and effort build, but they can come crumbling down when company direction shifts even slightly. Second, there exists a schism between academic & company cultures/aims, which which often makes cooperation difficult. Finally, graduate students and professors with niche, theoretical interests are unlikely to find research which piques their interest and is also of high demand in the private sector.

This report details the process by which we reached the conclusions described, and lays the groundwork for budding future organizations. We live in a world of ever-increasing sophistication, and experts with ever-narrower specialties. This is a time which requires more connection then ever between experts and the real world, and we hope this report contributes towards the development of these partnerships.

BUILDING ACADEMIC-GOVERNMENT PARTNERSHIPS

3.1 SUMMARY OF IDEA

> **Summary Points**
>
> - We identified a social problem of interest: the lack of scientific research in our state and local policies;
>
> - We sought to create a platform which would facilitate connection between policy-makers and academics of pertinent research interests;
>
> - We sought to create a platform which would facilitate connection between policy-makers and academics of pertinent research interests;
>
> - Our aim, for the purposes of this report, was to figure out whether there is enough of a need from the perspective of policy-makers or academics for such a platform to be viable.
>
> - We had 45 customer-discovery-style conversations with researchers, representatives of professional associations, public policy-makers, and university government relations officers.

We initially identified a number of problems in the public policy-making space that led us to our original idea for this project. Policy-making is decentralized – policy-makers on the local, state, and national level all concoct information from various sources, as think tanks and lobbyists, to create policy. This creates a tremendous demand for information – a demand which is met on the national level, but may be less than fully met, we hypothesized, on the state and local level. We hoped to create a system which would facilitate connection between scientifically-oriented academics and policy-makers, thus helping ground our politics in scientific research. While the lack of academic research in state and local politics is an issue, our customer discovery showed us that policy-makers in local government do not see lack of academic resources as a serious issue in their current operations.

Academic researchers are incentivized to publish papers, but not to implement their research as public policy. The process from initial-

stage research to public policy is long and uncertain. Under the current system, a researcher's work will only be implemented in public policy if it is picked up by the media (which is rare, and determined not by merit, but intrigue) or by a think-tank or political advocacy group. As a result, researchers in most fields of study rarely see their work implemented, and public policy-makers don't benefit from cutting-edge research. We discovered that while this problem certainly exists within certain segments of academia, it is not a pressing issue that broadly afflicts all of academia. For example, well-known researchers, who are most sought-after by public policy-makers, have already built connections with policy-makers, which they can draw upon without our help. Unfortunately, researchers at this stage also tend to have the least amount of time to devote to implementing their research as policy.

Our initial solution to these problems involved creating a nonprofit and website platform to connect policy-oriented academics with public policy-makers. We planned to create a matching system, such that academic researchers with innovative policy proposals could easily share their ideas with a selection of public policy-makers who were looking for policy solutions in that domain. We planned to design the platform such that researchers would translate their idea into short, simple policy proposals that a policy-maker could digest in just a few minutes. Interested policy-makers could request conversations with relevant researchers, and if a researcher approved the request, the two parties would begin to discuss options for collaboration. For successful partnerships, we would have encouraged pairs to stay in contact and collaborate on future projects, deepening their partnerships.

We still believe that this model would develop mutually-beneficial relationships between public policy-makers and researchers. Public policy-makers would gain easy access to a new source of innovative policy proposals that could imbue government with the power of cutting-edge research. Researchers would be able to easily build new connections with influential public policy-makers, relationships which could help them secure research funding and build their academic brand.

We also explored two potential features for the platform. First, we attempted to determine if we should incorporate a micro-grant-making system into the platform to provide a better incentive structure for researchers. This grant-making system would work in collaboration with professional associations such as the American Economic Association (AEA) and the American Psychological Association (APA). Second, we considered providing university government relations officers with "supervisor" accounts that would allow them to view and analyze the relationships developing between researchers at their institution and public policy-makers.

In order to validate this initial idea, we conducted 45 customer-discovery-style conversations with researchers, representatives of professional associations, public policy-makers, and university government relations officers. In addition, we received feedback from 9 state and local political offices that participated in our pilot program. Finally, we consulted with over 20 other people including lab meeting participants, graduate students, as well as family & friends with entrepreneurial experience. Our aim, for the purposes of this report, was to figure out whether there is enough of a need from the perspective of policy-makers or academics for such a platform to be viable.

3.2 CUSTOMER DISCOVERY

> **General Summary Points: Customer Discovery**
>
> - Professional Associations have some incentive to connect experts & policy-makers, but they lack resources & drive;
>
> - Legislative aids & policy-makers are constrained by politics & finance;
>
> - Legislative aids & policy-makers are not willing to pay for partnerships with researchers;
>
> - Most university government relations officers with whom we spoke either already had a suitable system for monitoring their researchers' connections with policy-makers, or they didn't have such a system and would not pay for one.
>
> - Some professors are willing to work with policy-makers, but few are eager, and the project must meet a plethora of constraints;
>
> - Overall: Stakeholders recognize the social problem, but pain is not concentrated on any particular stakeholder, which limits interest and willingness to pay.

3.2.1 *Academic Researchers*

> **Summary Points**
>
> - A one-size-fits-all model for building academic-government partnerships in different policy spaces would likely fail.
>
> - A one-size-fits-all model for building academic-government partnerships with many different kinds of policy-makers would likely fail as well.

We attempted to answer a number of questions based on our conversations with researchers. First and foremost, we wanted to determine if these researchers would put in time and effort to implement their research as public policy; our solution relied heavily on the assumption that researchers are willing to do so. Furthermore, we wished to determine to what extent researchers believe that they could benefit by implementing their research as policy and whether they currently find it difficult to connect and collaborate with public policy-makers.

We had 9 customer discovery conversations with researchers. Specifically, we spoke with Professor George Loewenstein, Professor Haylee Massaro, Dr. Deanna Matthews, Professor Silvia Borzutzky, Professor Linda Babcock, Professor Stan Caldwell, Professor Tim Zak, Professor Erica Fuchs, and Professor Alessandro Acquisti. Each of these nine researchers works at Carnegie Mellon University (CMU). Within the university, they hail from the Heinz College, the Dietrich College of Humanities and Social Sciences, as well as the College of Engineering.

These nine researchers universally liked the idea of developing a system to incubate relationships between public policy-makers and researchers. However, they also saw a number of issues with our idea that we took to heart when we later pivoted the idea in a new direction.

A common criticism, voiced in particular by Professor Loewenstein and Professor Babcock, is that our initial plan to enter all policy spaces at the same time would not adequately account for the degree of variation between different policy spaces; a one-size-fits-all model for policy spaces would likely fail.

Similarly, we initially proposed a one-size-fits-all model for how public policy-makers would use our platform; for example, we didn't distinguish between regulators, legislative aids, and politicians. Feedback from Professor Babcock led us to focus in on legislative aids, which helped drive this project forward. Professor Massaro helped us better understand the institutional incentives for researchers around

public policy implementation; even schools that emphasize the importance of applied research, such as CMU's Heinz College, barely consider a researcher's policy work when they evaluate candidates for tenure.

3.2.2 *Professional Associations*

General Summary Points: Professional Associations

- Initial Thoughts:
  - Professional Associations (PAs) could champion our platform;
  - PAs could provide micro-grants to members who work to inform policy-makers;
- We reached out to fifty members of PAs and had conversations with five members.

We had a few significant questions we were trying to answer based on our conversations with leaders of Professional Associations. First, we saw these associations as potential champions of our academic-government partnership platform – perhaps they would encourage their members to join such a platform in order to gain a political foothold and amplify the role of their members in the policy-making process. Second, it was suggested to us by people such as Tim McNulty (CMU's Associate Vice President of Government Relations) that these associations may be able to provide micro-grants to compensate members of their profession for the time they take to work with policy-makers.

We reached out to fifty members of leaders of professional associations, including the American Psychological Association (APA), American History Association (AHA), American Dental Association (ADA), American Association of Motor Vehicle Administrators (AAMVA), Semiconductor Industry Association (SIA), Institute for Electrical and Electronics Engineers (IEEE), American Medical Association (AMA), American Sociological Association (ASA), American Economic Association (AEA), American Law and Economics Association (ALEA). We had conversations with five of these members – Patrick McCarren of the IEEE, Patricia Kobor of the APA, Jeff Reger of the AHA, Jean Shin of the ASA, and Eddy Ameen of the APA.

Summary Points: IEEE

- IEEE is focused on professional networking & development.

IEEE appears to be more focused on professional networking and development than any political goals. IEEE gets grants from outside organizations, and does not have a grant-making process of its own. Patrick McCarren was not aware of any efforts to connect IEEE members with policy-makers, but there is IEEE USA – the lobbying arm of the IEEE, which is in charge of achieving funding goals.

> **Summary Points: APA**
>
> - APA is a bureaucratic stumbling behemoth;
>
> - They focus on amplifying the role of psychology in policy-making & securing favorable legislation;
>
> - APA has a "Government Relations" (lobbyist) team of twenty-thirty people;
>
> - They fund psychologists who connect with policy-makers on a case-by-case basis:
>   - They see scientists located within a policy-maker's district as valuable assets;
>   - They host a two-day training for psychologists on how to interact with policy-makers.

Patricia Kobor is the Senior Science Policy Advisor to the APA, while Eddy Ameen oversees the Office on Early Career Psychologists. Based on these conversations, it appears the APA is heavily focused on amplifying the role of psychology in policy-making and securing legislation favorable to psychologists.The APA has a series of initiatives to achieve these goals; for one, Patricia Kobor is among APA's many lobbyists (the APA's "Government Relations" team has about twenty-thirty people), and works to secure funding for the National Institutes of Health (NIH). The APA funds psychologists who connect with policy-makers (mostly on a case-by-case basis; e.g., if the APA is promoting a particular initiative, Patricia might reach out to a relevant psychologist and fund their travels to Washington D.C.).

The APA sees scientists located within a policy-maker's district as an especially valuable asset, as policy-makers are far more likely to rely on the advice of local thought-leaders. The APA also has initiatives to familiarize politicians with laboratories and the academic facilities where psychological research takes place. In addition, the APA hosts a two-day training for psychologists on how they can interact with policy-makers. Despite all of these initiative, based on informal conversation, there is reason to believe that the APA is an incredibly bureaucratic, stumbling behemoth of an organization.

> **Summary Points: AHA & ASA**
>
> - They are far smaller than APA and have no more than one person to connect members with policy-makers;
>
> - They are funded by grants, so they don't have a large grant-making capacity.

The AHA and ASA are considerably smaller than the APA. They are themselves largely funded by grants, and lack a focused government relations arm (in fact, the ASA can't lobby, because it's a non-profit). The AHA does have a dedicated person to organize events which connect policy-makers and academics or inform one of these groups about a policy issue. Overall, while these organizations view our goals as honorable, they lack the resources and reach to significantly extend our impact.

On the whole, many of these professional associations, especially those focused more on the soft sciences share our goals of amplifying the role of academia in policy-making. The AHA and ASA are substantially smaller than the APA and lack the resources to effectively achieve these goals independently, but they could still provide access to a large network of professionals. The IEEE is far more focused on professional development and networking than anything else. The APA is a uniquely large and extensive organization which is focused on lobbying and policy-making. Depending on our framing, the APA could see us as a competitor, or work with us towards achieving our common goals. The APA does have the financial resources to fund connections between psychologists and public policy-makers, and they do so already, but not in a systematic way.

3.2.3 *Policy-Makers*

As we were initially aiming to connect academic researchers with legislative aids, aids to the Governor, and departmental policy-makers, we sought to gain a better understanding of the roles of legislative aids & policy-makers – what they do day-to-day, their greatest pain-points and motivators, as well as their career idiosyncrasies and inside jokes (unfortunately, we weren't able to gain insight on the latter). More specifically, we sought to ascertain how much time policy-makers spend on academic research & in communication with academic researchers, identify challenges of conducting research & working with academics, and note the most significant on-the-job inefficiencies & common sources of dissatisfaction. We thus contacted approximately 250 legislative aids, Governors' aids, and departmental policy-makers in Pennsylvania; ultimately, we had conversations with thirteen of these individuals.

3.2.3.1 *Legislative Aids*

> **Summary Points: Legislative Aids**
>
> - Everyday Goals:
>   - Draft legislation;
>   - Engage in floor activities, committee meetings, public hearings, special causes;
>   - Meet with stakeholders.
> - Approach to Research:
>   - Analyze existing policies in other states;
>   - Occasionally utilize academic research.

Our conversations with legislative aids told us a lot about the everyday routine for these individuals. A policy aid in the Democratic Office of Legislation & Policy for the Pennsylvania State House of Representative spends much time drafting legislation, and oscillating between various interested parties who give input and direction. The aforementioned policy aid is involved in floor activities, committee meetings, public hearings, and special causes. Legislative aids spend much of their time in contact with fellow staffers, their counterparts from other offices, administrative policy-makers, and community stake-holders.

The policy aid spends a large amount of time researching topics – anywhere from 10 to 12 hours on a regular week, and up to 30 hours on a heavy week. The research often begins with looking at existing policies in other states; for more technical subjects, as the opioid crisis, they utilize peer-review articles as well. The research done by policy aids is sometimes retroactive – instead of trying to distill a new position, they try to justify an existing one. There are significant political, financial, and logistical constraints to including academics in their work.

3.2.3.2 *Committee Aids*

> **Summary Points: Committee Aids**
>
> - Everyday Goals:
>   - Prepare bill analyses;
>   - Explicate bills to legislators;
>   - Meet with stakeholders.
>
> - Approach to Research:
>   - Utilize Legislative Reference Bureau;
>   - Analyze existing policies in other states.

The primary responsibility of a committee aid is to prepare bill analyses – this process takes up about 50-75% of their day, and requires careful reading of legislation, stakeholder outreach, and issue reconciliation. Besides preparing bill analyses, committee aids spend much of their time explicating bills to various members and drafting legislation.

Some committee aids repeatedly reach out to universities that they have worked with in the past – for example, we spoke with a research aid on the finance committee who frequently utilizes Georgetown's research on retirement to inform his work. The National Conference of State Legislatures (NCSL) is the first stop of many staffers – it allows them to compare laws between states. They rarely speak with professors, and any sort of collaboration typically takes years to come to fruition. Pennsylvania also has a Legislative Reference Bureau (LRB) which legislators can utilize to conduct research; depending on the members' request, the LRB may reach out to university faculty. Committee aids mostly research current state processes and compare them with equivalent processes in other states. They also infrequently reach out to administrative departments and lobbying groups.

3.2.3.3 *Governor's Aid*

> **Summary Points: Governor's Aid**
>
> - Everyday Goals:
>   - Coordinate information flow between administrative agencies;
>   - Meet with community stakeholders & lobbyists;
>   - Meet with legislators to discuss legislation.
> - Approach to Research:
>   - Basic online research;
>   - Utilize experts from administrative agencies.

We spoke with Sam Robinson, one of Governor Wolf's Deputy Chiefs of Staff (DCS). The DCSs coordinate between administrative agencies, lobbyists, community stakeholders, and legislators. Every day is different, Sam told us.

There seems to be little communication between the DCSs and academic researchers. A DCS will frequently go into a policy meeting cold (without prep), or do some minimal research online. For more significant meetings, they may loop in someone from a specific administrative agency. Agency experts and national sources frequently put together briefings for the DCSs, and interest groups will sometimes directly send academic papers to the DCSs. However, academic papers are most commonly utilized in policy when an interest group digests and includes them in a white paper, which is then sent to the DCSs or their staff.

3.2.3.4 *Departmental Policy-Makers*

> **Summary Points: Departmental Policy-Makers**
>
> - Everyday Goals:
>   - Prepare bill analyses;
>   - Meet with stakeholders & legislators.
> - Approach to Research:
>   - Utilize Legislative Reference Bureau;
>   - Utilize trusted sources (e.g., AAA, NCSL).

We spoke with policy-makers from Pennsylvania's Department of Environmental Policy, Department of Transportation, and Department of Community & Economic Development. Departmental policy-makers

must be knowledgeable about all issues relevant to their department, so they don't have time to dive into the weeds on any particular issue. Departmental policy-makers divide their time each day between analyzing bills, coordinating legislators & departmental staff, and meeting with stakeholders.

Departmental policy-makers frequently work with the Legislative Reference Bureau when they need information from the academic literature. When a bill is drafted, agency officials and legislative aids conduct little academic research – they have to focus on juggling stakeholders and practical concerns. Many departmental policy-makers have a few sources they trust; for example, the American Automobile Association provides valuable information to the PA Department of Transportation (PennDOT). Departmental policy-makers noted that academics focus quite narrowly in their research – an academic might consider the environmental impact of a policy, for instance, without considering the economic or political ramifications; generally, departmental policy-makers benefit more from studies that consider many possible impacts of a policy instead of just a select few. Departmental policy-makers would benefit from a simple directory of academic researchers with differentiated areas of expertise; however, this would not reconcile the broader schism between academia and public policy – that academics speak a different language and have interests that are imperfectly aligned with policy decisions.

3.2.4 *University Government Relations Offices*

> **Summary Points**
>
> - CMU's government relations office was enthusiastic about our work and willing to run a pilot;
>
> - CMU's government relations officers would like to spend more time connecting researchers with policy-makers, but they are unable to do so because it's a time intensive activity;
>
> - Most government relations officers with whom we spoke either already had a suitable system for monitoring their researchers' connections with policy-makers, or they didn't have such a system and would not pay for one.

We conducted twelve customer discovery conversations with university government relations offices (or equivalent), in order to determine if these offices would be willing to finance our program through a university-wide subscription model. Specifically, we spoke with government relations offices from Stanford University, Dartmouth University, Columbia University, Cornell University, Princeton Uni-

versity, Duke University, University of Notre Dame, Brown University, and Carnegie Mellon University. Please note that in some cases, we spoke multiple times with the same person or spoke with two different people from the same university.

Carnegie Mellon University's government relations office was most interested in supporting our effort to build a platform through which they could monitor the ongoing connections between faculty members and public policy-makers. We spoke a few times with Tim McNulty, an Associate Vice President of Government Relations at CMU; conversations with Mr. McNulty yielded a few valuable insights. First, in our second meeting, Mr. McNulty stated that he spends approximately 10-15% of his daily time initiating partnerships between local policy-makers and CMU's faculty, however, he would like to spend approximately 33% of his time building those connections. Out of all of our conversations, this was the clearest instance where a government relations officer wanted to increase the amount of time that they devote to developing academic-government partnerships, but they were unable to do so due to the time intensity of the task. We do recognize that the authors' status as CMU undergraduates may have engendered unusually high enthusiasm for the idea.

In our conversations with government relations officers, the most common story was one where the officer was mostly satisfied with the quality and quantity of academic-government partnerships. Some officers stated that they would like to facilitate more partnerships, but they didn't see it as a high priority. Al Dahlberg, the state/local government relations officer for Brown, brought up a unique point: it would be irresponsible of Brown's government relations team to overburden faculty with academic-government partnerships that could likely fail; it is a waste of the faculty's time, and therefore, it is not a viable strategy for Brown's government relations office. All told, CMU's government relations office seemed uniquely interested in finding a better way to build academic-government partnerships.

In our second meeting with Mr. McNulty, he defined a spectrum of university government relations offices according to their goals and philosophy. On one end of the spectrum are government relations offices that primarily view their job as securing specific funding for researchers. These institutions are focused on building support for competitive funding by supporting faculty leadership & specific programs. Offices with this philosophy are typically more devoted to building partnerships between their researchers and policy-makers, since these partnerships can serve as a foundation for future funding requests; researchers who help a policy-maker improve the quality of their work would likely receive reciprocal support. CMU, Case Western, and Lehigh University are examples of schools that use this approach.

On the other end of the spectrum are government relations offices that focus their efforts on increasing the pool of available research funding. They are primarily concerned with (for example) lobbying for a 2% increase to the National Science Foundation's budget or a 3% increase to the National Institutes of Health's budget. These schools expect to always receive a sizable proportion of the overall research funding pool, so they instead focus on increasing the size of the pool. Harvard, Princeton, Columbia, and Brown are examples of schools that use this approach.

Most schools are between these two extremes. For example, the University of Pittsburgh focuses its government relations efforts around funding opportunities for their health sciences researchers; this topic-oriented approach is more similar to CMU's approach than Columbia's, but it is distinct from both.

Finally, we discuss a few interesting findings from these conversations. Most government relations offices already have a system for keeping track of their researchers' partnerships with policy-makers. These systems are idiosyncratic and uniquely fit the policy environment experienced by the institution; a one-size-fits all model is not as attractive as we originally believed. Furthermore, government relations offices that do not systematically keep track of their researchers' partnerships with policy-makers did not see significant value in such a system, according to our conversations.

3.3 PILOT PROGRAM

> **Summary Points**
>
> - We began a pilot program to connect eight local/state government offices with researchers at Carnegie Mellon University;
>
> - There is greater potential for academic-legislative collaboration around nonpartisan and bipartisan issues;
>
> - Our pilot program with Pennsylvania State Representative Chris Rabb is still ongoing.

In December 2018, we began running a pilot program to explore the ways in which researchers and public policy-makers can successfully built partnerships. To do this, we decided to reach out to local/state public policy-making offices and then to connect these offices with Carnegie Mellon University researchers who could offer innovative input on issues relevant to their office's agenda. We planned to remain cc'd on emailed correspondence and join phone calls to observe the partnership development between researcher and public policy-maker.

We emailed the offices of seventeen local council members, 252 Pennsylvania State Representatives and Senators in Harrisburg, and seven local policy staffers. From this initial outreach effort, we received twenty positive responses from offices/individuals who wanted to participate in our pilot program:

- Three PA State Senators;

- Twelve PA State Representatives;

- One county councilman;

- Three Pittsburgh city council-people;

- One Pittsburgh city policy-maker.

Of the twenty respondents, we had eight initial calls to discuss the policy interests of those offices. As the semester progressed and we determined that a pivot to our approach was necessary, we chose to shut down the pilot for all twenty participants, expect for PA State Representative Chris Rabb. "Rep. Rabb" was the most promising of the twenty respondents due to his enthusiasm for the pilot and his strong academic background. Because of these and other factors, we determined that he was the most likely to successfully develop a long-term partnership with a researcher, through his participation in the pilot. The pilot program with Rep. Rabb is still ongoing.

One key takeaway from the pilot is that policy-makers will inherently limit their thinking to partisan solutions when they are confronted with partisan issues. Therefore, partnerships between policy-makers and researchers will be most successful when they revolve around non-partisan or bipartisan issues; in both situations, both political parties agree that a problem exists, but effective solutions have not yet been presented.

Furthermore, while it is very difficult to find an exact match between the researcher's expertise and the policy-maker's need, a perfect match is not necessary. We presented Rep. Rabb with a catalog of interested researchers who had research expertise that generally intersected with his legislative goals; he thought that it was great. This strategy helps the policy-maker gain valuable expertise, and it also gives the researcher an opportunity to focus the policy-maker's engagement around a niche research topic, which the policy-maker may have previously ignored.

3.4   THE PIVOT

A few discoveries finally led us to conclude that this business and project idea was not viable. The researchers and public policy-makers

who are truly committed to implementing research in public policy have already figured it out for themselves. Researchers and public policy-makers who are not committed to this mission see the gap between academia and government as a minor problem compared to the political and financial constraints that they face on a daily basis.

Some universities would be willing to pay for a platform to coordinate their researchers' partnerships with public policy-makers, but again, they don't believe that their current methods are are limiting outcomes; better organization would be nice, but it wouldn't dramatically improve their operations. Whether or not a school's government relations office tracks their researchers' partnerships with public policy-makers is a function of how integral such coordination is to the mission of the office.

Thus, we felt that, while the social mission we set out to accomplish is significant and worthy, we lack sufficiently-concentrated interest from the academic and government worlds for an intervention to succeed. At this stage, our thinking started shifting towards another sector which is not nearly as constrained as public policy-making, and needs intellectual capital just as much – the private sector.

BUILDING ACADEMIC-CORPORATE PARTNERSHIPS

4.1 SUMMARY OF IDEA

> **Summary Points**
>
> - A few factors led us to explore academic-corporate partnerships: the private sector's financial resources, and the value of research to corporate America.
>
> - We were most interested in private sector partnerships with individual academics, but we were open-minded about the form these partnerships could take.
>
> - Our primary concern for this project: is there a significant need for more/better partnerships between the academic and private sectors, from the two perspectives of academia and industry?

Based on our customer discovery conversations, we decided to explore the landscape of academic-corporate partnerships. This is a far more promising area in a few ways; (1) the abundance of financial resources in the private sector, (2) the dynamic and agile nature of the private sector, (3) the variability of research needed for private sector development, and (4) the value that many in academia see in working with the private sector.

Embarking upon research on this topic, we were open-minded about the precise form our platform to facilitate these partnerships would take. One option was to present professors as experts, allowing companies to select and contact the expert of their choosing. Another option was to provide companies an opportunity to submit requests for proposals for a research question, then select the most promising proposal and hire the researcher.

As with the idea to build partnerships between academic researchers and policy-makers, our primary concern was the question of need: are companies willing to pay for opportunities to partner with researchers? Are there researchers who would be not only willing, but enthusiastic to work with companies?

4.2 CORPORATE-UNIVERSITY ENGAGEMENT TODAY

The research & write-up of this section (4.2) is a slightly edited representation of parts of a report compiled for a Methods of Policy Analysis Class. Greg Volynsky is one of the co-authors of the report, along with Bolade Fatade, Mukunth Arjunan, and Rosana Guernica, under the supervision of Lee Branstetter. The report details the means of engagement between Carnegie Mellon as an institution and the private sector; the selections help paint a picture of the goals of such collaborations, and the various mediums which exist for these collaborations to take place.

4.2.1 *Nationwide University-Corporate Trends*

> **Summary Points**
>
> - There is a general increase in funding for university-corporate relations, caused by a decrease in federal funding, increase in specialization, and increased job market competitiveness.
>
> - Universities financially benefit from corporate partnerships; corporations benefit from access to intellectual capital.
>
> - There are significant difficulties in bridging differences in culture and values of academia and the private sector, in addition to important legal questions.
>
> - There are no widely-accepted guidelines for university-corporate partnerships.

The total amount of corporate dollars being invested in university research has been increasing in recent decades. The exact amount of corporate investment in universities remains unknown as universities, both public and private, are not obligated to disclose corporate donations or funding sources. This increase in university-corporate relations is likely a consequence of the following:

- An overall decrease in federal funding for universities and their research;

- Innovations with commercial applications creating an increased need for specialized knowledge, product differentiation, and cost differences;

- And an increasingly competitive job market, making talent acquisition and retainment expensive and challenging. ("Job Openings and Labor Turnover Survey")

Universities benefit from their corporate partners by way of sponsored Ph.D. programs, sponsored faculty-research, sponsored student-research, gift funding, donated or sponsored infrastructure projects, discounted software, and internship, full-time, and part-time employment opportunities for their student populations. Corporations benefit from having access to faculty and student research which innovates their current business lines and from developing a presence on campus which lowers the barrier to recruiting and maintaining talented employees.

These relationships, however fruitful, face unique difficulties. University and corporate employees face differences in values, culture, and work processes. Corporate employees operate under strict budgets, time-frames, and end goals. The nature of research, however, does not allow for such assurances. Researchers focus on achieving robust and repeatable results whereas corporations can cope with more ambiguity. The two entities also differ in simple work processes such as communication methods; corporate employees gravitate towards phone calls and university employees commonly use email. Differences also emerge in areas of much more significance. Universities, who are not allowed to sell products or services under IRS laws, also face the challenge of walking a thin line between corporate partnerships and said business transactions, commonly referred to as 'pay-for-play'. Corporations struggle with being able to budget and commit to uncertain outcomes. Furthermore, corporations and universities must fine-tune agreements to account for the intellectual property (IP) rights over any IP that may arise from the partnered research, another strong point of contention.

University-Corporate sponsorship has proved beneficial for both parties and has produced meaningful and innovate work. Yet, there are no widely accepted guidelines for how university-corporate partnerships should be arranged. Current suggested practices come from a variety of universities, journals, and centers. However, the American Association of University Professors did produce a 'Summary of Recommendations' ("56 Principles to Guide Academy-Industry Engagement") which highlights 56 principles to guide academy-industry engagement. Across the board, programs are built ad hoc and institutional support varies from university to university.

4.2.2   *Corporate Relations at Carnegie Mellon University*

4.2.2.1   *Interviews with the CMU Corporate Relations Community*

Interviews with faculty and employees of CMU who were integral to university-corporate relationships were conducted to better understand the intricate system of University-Corporate relations in CMU.

> **Summary Points: Alka Patel**
>
> - Role: Runs Risk & Regulatory Services Innovation Center, which facilitates formal collaboration with PWC;
>
> - Take-Aways: Significant schism between academic & corporate culture, which takes a dedicated person (in this case, Alka) to navigate university-corporate partnerships successfully.

Alka Patel: Alka Patel runs the Risk and Regulatory Services Innovation Center, a venture by CMU and sponsored by PWC. The main goal of the center is to connect businesses with students and researchers. Alka shed some light on some important issues like the absence of a non-centralized data system and how it's hard as an emerging business to find which resources are useful and how to tap into these resources. However, her largest point of contention was the wide difference in organizational processes and cultures between students, researchers and businesses. For example, businesses prefer their communication through phone calls while academia prefers emails. This is a small example on a list that includes difference in ideals and priorities for funding, research deadlines, etc. In general, it is difficult for businesses to adapt to the pace of academia culture and vice versa.

> **Summary Points: Reed McManigle**
>
> - Role: Senior Manager of CMU's Center for Tech Transfer, which primarily helps small CMU startups obtain external corporate sponsorship;
>
> - Take-Aways: Silos of knowledge within the CMU ecosystem; Reed favors creating a centralized repository of knowledge about corporate partners and points of contact at CMU.

Reed McManigle: Reed McManigle works as the Senior Manager of CMU's Center for Tech Transfer. The Center for tech transfer is a smaller more creative division of CMU's University-Corporate relationship which primarily helps small startups from CMU obtain external corporate sponsorship. Speaking to Reed shed light on a multitude of his concerns, the main one being the lack of sharing of information. There are large information silos within CMU's university-corporate workforce which create inefficiencies. While some offices have started to use salesforce and a map is being created to show who is a part of this process, it still hasn't become a well-oiled machine. Reed believes that consolidating all personal knowledge of CMU's University-Corporate relations from multiple resources and individuals within CMU who deal with said relationships into institutionalized knowledge (making it common for all) either through

a database or salesforce, etc. would be greatly beneficial to the efficiency and capacity of the relationships.

> **Summary Points: Mark Nolan**
>
> - Role: Director of University-Corporate relations;
>
> - Take-Aways: Favors centralization of CMU's expertise, potentially creating a searchable database of CMU experts.

Mark Nolan: Mark Nolan is the director of University-Corporate relations and runs Engage @ CMU. As the head of relations and the main voice outside CMU for University-Corporate relations, he was able to give a bird's eye view of the system. Mark Nolan's goals vary; on the one hand he believes that research funding and licensing of university tech property are strong metrics with which we can measure success of University-Corporate relationships, but on the other hand he is focused on protecting the time and interests of students and faculties in these relationships. However, his overall goal is to create meaningful and lasting relationships which benefit both the University academia and the businesses. He stated that instead of asking the question, "What companies can give to the university" he would like to ask "What can we give each other" as this is more likely to create an equal and long standing relationship rather than a short one. As the director, he believes CMU has room for improvement and spoke about the effectiveness of University of Michigan's engagement center and the Statewide Experts Portal as benchmarks for data centralization. Mark Nolan is also strongly involved with local Pittsburgh businesses and teams who work on this like InnovatePGH, Innovate Works, the Red Team, etc. He wants to attract more companies to Pittsburgh and help bring forth a large AI market.

> **Summary Points: Lenna Cominos**
>
> - Role: Associate Director, Corporate and Institutional Partnerships for Electrical and Computer Engineering at CMU;
>
> - Take-Aways: Favors centralization of data regarding CMU's corporate partners; however, cautious about sharing her connections, for existing partnerships could be undermined.

Lenna Cominos: Lenna Cominos was one of the first interviews who worked with the system at a collegiate level and helped us understand the difference between her duties and priorities when compared to university level like Engage @ CMU or Centre Tech Transfer. Lenna is the Associate Director, Corporate and Institutional Partnerships for CMU's Electrical and Computer Engineering. Lenna was able to show us two successful University-Corporate relationships: Ansys and Bosch. Lenna was able to give her perspective on a data centralization system, while she believes it's necessary (she states that

"my notes are a combination of physical notes, files, Evernote and out-look. If I left my position tomorrow and it would be impossible for someone to pick up where I left off") she is cautious as at the collegiate level, industry relations are strategically developed and cultivated. The presence of a centralized system can jeopardize this it is possible for someone to see the contact on the system and call them, potentially derailing ongoing strategic initiatives. Lenna also pointed out that University of Michigan's system may not be replicable for a smaller school like CMU.

> **Summary Points: George Darakos**
>
> - Role: Director of Partnerships at CMU's School of Computer Science;
>
> - Take-Aways: Ostensibly supports centralization of CMU's expertise; however, emphasized the importance of human connection. As the mediator of relationships, George is able to give companies a holistic overview of the CMU universe, and thus expand the scope of partnerships over time.

George Darakos: George Darakos is the Director of Partnerships at CMU's School of Computer Science. George Darakos' goal is to seek to help the corporate world navigate academia and to help the CMU ecosystem navigate the corporate world. His interest lies in student, corporate, and faculty interactions. Most of his interactions with corporate is through recruiting and internships. He believes that all university-corporate relationships should be long-standing and should grow so that they access other parts of CMU as well, this is how he measures success apart from research opportunities and funding (as he states "not splitting the pie of CMU, but rather enlarging it for companies"), examples of broadening is by sponsoring a hackathon or a capstone in CMU to cultivate ideas and research. He maintains a talent pipeline for students through which internships can be given. George supports the idea of a data centralization system like University of Michigan and utilizes salesforce, but he said it should be taken with a grain of salt. Companies sidestep his office to approach faculty and students, but this is due to: the lack of an established hierarchical order in CMU's university-corporate system and company's lack of knowledge on the multiple ways to interact with faculty.

> **Summary Points: Jon Nehlson**
>
> - Role: Associate Dean of Partnerships and Communication Strategy at CMU's Heinz College;
>
> - Take-Aways: Heinz mostly focused on workforce training, student employment opportunities, & research funding. Shares information with Mark Nolan.

Jon Nehlson: Jon Nehlson is the Associate Dean of Partnerships and Communication Strategy at CMU's Heinz College. Out of all the interviews conducted, Jon Nehlson's role at Heinz and the way Heinz operates with university-corporate relationships is the most unique. Heinz operates more independently from the rest of the university and has more idiosyncratic relationships with its corporate partners. Heinz actively manages a pipeline of 300-400 companies which is its primary mode of engagement with corporate. Jon aims to create and maintain sticky relationships with alums and businesses through absorbing and training students for two years before re-releasing them to the workforce, or experiential learning in the classroom with Heinz alums. He states that the system in Heinz is more similar to CMU Tepper's MBA or CPDC (Career and Professional Development Center). He shares information with Mark Nolan through the Advance system but believes that it can be more streamlined and effective. The way he monitors success of corporate relationships is through research and grant funding but also through the trajectory of hiring companies and the length of time it takes a student to find employment post-graduation.

> ## Summary Points: Interview Overlaps & Discrepancies
>
> - Overlaps:
>   - Most favor some form of greater centralization of both CMU's expertise & CMU corporate partners;
>   - All agree CMU uses a de-centralized model of corporate engagement;
>
> - Discrepancies:
>   - Lenna and George were concerned that centralization may jeopardize carefully crafted relationships, while Mark and Reed appear to be more adamant supporters;
>   - There is also a discrepancy in focus – Lenna, George, and Jon are more focused on the benefits faculty and students reap from corporate relationships, while Mark and Reed are primarily concerned with the number of relationships and long-term benefits for the CMU ecosystem through research funding. Mark takes this a step further, looking at the benefit of research dollars on Pittsburgh's economy more generally.

Overlaps & Discrepancies between Interviewees: When looking at all the interviews and their takeaways, there is some consensus and some discrepancies. The most important issue to tackle is the potential for CMU to have a centralized data system. While all our interviewees believe that the data sharing and storage process isn't as streamlined as it could be, most of the collegiate level (Lenna and George) are concerned that this system will jeopardize carefully crafted re-

lationships. There is no way to know who is working with which company and a centralized system would allow anyone to reach out to any company, unaware of how this will impact already working relationships. Mark Nolan and Reed McManigle, who are strong advocates of the Michigan model, see it as a good idea as their job is to compile and maximize university-corporate relationships and a centralized data system would help them immensely. However, for colleges whose main role is to establish and cultivate these relationships, a centralized system may make that job harder. Another interesting discrepancy is the priorities set forth by University level (Centre for Tech Transfer & Engage @ CMU) and collegiate level. Lenna, George and Jon are all more focused on faculty and students and what they can get out of this. Most of their interactions with businesses are through internships, research and recruiting. Mark Nolan and Reed McManigle are primarily concerned with increasing the number of relationships and making sure these relationships provide long-standing benefits for the CMU ecosystem through research funding. Mark Nolan takes it a step farther in the fact that he's looking at the impact this will have on Pittsburgh's economy.

4.2.2.2 *Details of CMU's Corporate Relations Strategy*

> **Summary Points**
>
> - There are six major stages of CMU's interaction with corporations: Internships, Sponsored Projects, Startup Acquisitions, Technology Licensing, Joint Research Centers, & Establishment of New Research Facilities;
>
> - These stages frequently bleed into each-other;
>
> - Ansys Hall and Bosch are examples of two companies whose symbiotic relationship with CMU has reaped significant benefit both to CMU and the corporation, and whose relationship has progressed significantly over time.

The ways CMU interacts with corporations has six major stages, each varying in the level of investment required (with regards to both time & effort). These levels are depicted above, in ascending order from low investment, to high investment. The six stages are through Internships, Sponsored Projects, Startup Acquisitions, Technology Licensing, Joint Research Centers & the establishment of New Research Facilities. It should be noted that there isn't always a rigid, fragmented relationship between each stage, as the different levels frequently "bleed" into each other. Companies might operate back and forth between different stages and might even be engaged on multiple levels simultaneously. Engagement efforts don't always follow the order in which they've been delineated as the various levels

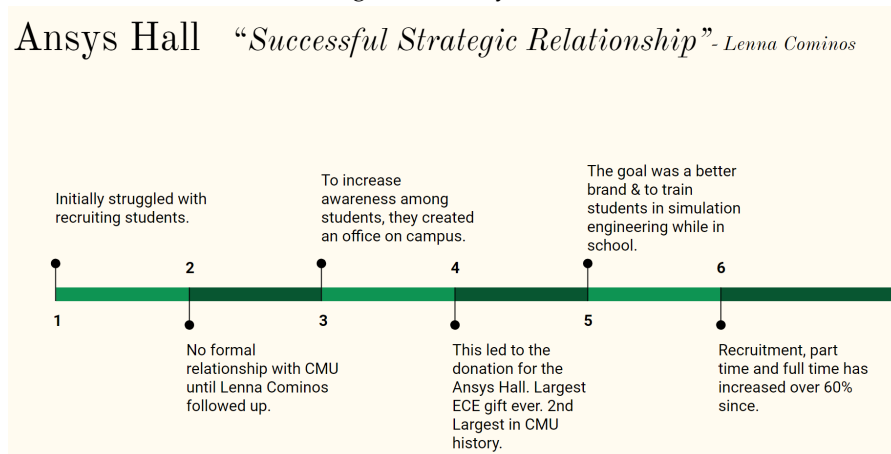Figure 1.: Modes of Engagement between CMU and its Corporate partners.

CMU-Corporate Modes of Engagement
From low investment to high investment)

1	2	3	4	5	6
Internships	**Sponsoring Projects**	**Startup Acquisition**	**Licensing Technology**	**Joint Research Center**	**New Research Facility**
Get candidates into recruiting pipeline for full-time employment	Get students to help solve pain-point, might lead to full time employment.	Purchase ownership of a company, typically for IP or talent.	Pay to commercialize research, to leverage IP.	Partner with institution to conduct applied research over a longer term horizon.	Establish independent researcher independent but close to university.
For: Students	For: Students	For Faculty and graduate students.	For: Faculty and advanced graduate students.	For: Faculty and advanced graduate students.	For: Faculty and advanced graduate students.
Examples: Career Fairs, On-campus info sessions.	Examples: Reverse Pitches, Innovation Challenges Hackathons	Example: NoWait	Example: cmu.flintbox.com	Example: PWC Risk & Regulatory Services Center	Example: Bosch Research Technology Center

are occasionally intertwined – subsequent case studies will show how activity in one area might affect performance in another area.

Internships are the most common and often happen without the need for any formal established relationship. Often a company might choose to recruit formally after establishing contact through the Career & Professional Development Center. On the other hand, companies might engage with students more directly without any explicit involvement with the CPDC.
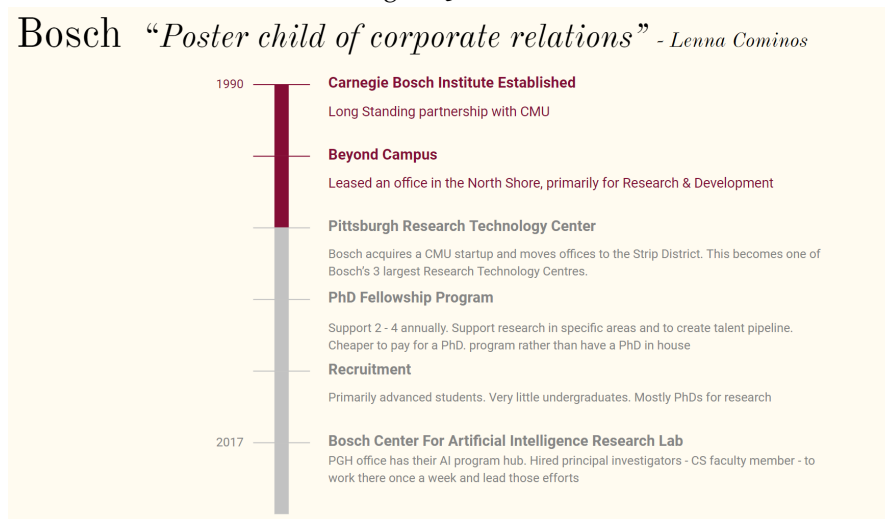
Sponsored projects are also common, as they might improve the awareness as well as the perception of different companies on campus. Anecdotally, sponsored projects have been shown to be a great way for relatively unpopular companies to gain visibility on campus. Companies often fast track their development and deployment of breakthrough technologies either by licensing technologies, or acquiring CMU-spun startups along with their IP. Joint Research Centers and New Research Facilities aren't as common as the rest, given that they're often multi-year partnerships.

Figure 2.: Ansys Hall

Ansys Hall   *"Successful Strategic Relationship"* - Lenna Cominos

Initially struggled with recruiting students.		To increase awareness among students, they created an office on campus.		The goal was a better brand & to train students in simulation engineering while in school.
2		**4**		**6**
1	**3**		**5**	
	No formal relationship with CMU until Lenna Cominos followed up.		This led to the donation for the Ansys Hall. Largest ECE gift ever. 2nd Largest in CMU history.	Recruitment, part time and full time has increased over 60% since.

Case #1: Ansys: Ansys was referenced by one of our interviewees as a "Successful strategic relationship". Prior to having any formal engagement with CMU, the company had difficulty with recruiting students. After a conversation between Dean of the ECE Department and the CEO of Ansys, Lenna Cominos, Director of Corporate Relations for the ECE Department reached out to establish a relationship. Ansys subsequently opened on office on campus, thereby enjoying greater visibility among students as a result of the proximity. This proved to be mutually beneficial, as Ansys subsequently made a donation to the College of Engineering for the building of an ANSYS Hall, the largest gift in ECE History & the 2nd largest gift CMU has received. The results of these efforts are significant, as the company has enjoyed a 60% increase in recruitment ever since.

Figure 3.: Bosch

Bosch *"Poster child of corporate relations"* - Lenna Cominos

1990 — **Carnegie Bosch Institute Established**
Long Standing partnership with CMU

Beyond Campus
Leased an office in the North Shore, primarily for Research & Development

Pittsburgh Research Technology Center
Bosch acquires a CMU startup and moves offices to the Strip District. This becomes one of Bosch's 3 largest Research Technology Centres.

PhD Fellowship Program
Support 2 - 4 annually. Support research in specific areas and to create talent pipeline. Cheaper to pay for a PhD. program rather than have a PhD in house

Recruitment
Primarily advanced students. Very little undergraduates. Mostly PhDs for research

2017 — **Bosch Center For Artificial Intelligence Research Lab**
PGH office has their AI program hub. Hired principal investigators - CS faculty member - to work there once a week and lead those efforts

Case #2: Bosch: Hardly any conversation about CMU Corporate Relations happens without mention of Bosch, a quintessential example of a longtime, multifaceted relationship. Bosch's relationship with CMU dates back to the 90s with the establishment of the Carnegie Bosch Institute. Initially built to educate potential corporate executives, the CBI was established conduct research in order to "improve international management and its impact on leadership". In the 29 years following, Bosch has endowed PhD fellowships for students, leased offices in the North Shore (and later the Strip District), acquired CMU Startups and created a Research Technology Center. In 2017, this relationship took yet another leap as Bosch established a Center for Artificial Intelligence Research Lab. To this end, they've recruited principal investigators & a CMU CS Professor to lead the efforts.

4.2.3   *CMU's Point of Contact Matrices*

> **Summary Points**
>
> - We created a map of CMU's connection to industry;
>
> - The map demonstrates the decentralized and clustered nature of CMU's approach to corporate relations.

Though the interviews a general understanding of each point of contact and who they interact with was obtained. Using this, a map which shows how CMU is connected to the Industry was constructed.

At the center there are Mark Nolan and Reed McManigle who act as the main connectors between colleges and the industry (more so Mark than Reed as he works mainly with Startups and maintaining a pipeline of said startups). The SCI school of University of Pittsburgh was also included, it is interesting to note that there is no point of contact for University-University relations and it is assumed that Mark Nolan would also be their point of contact.

Further, three individual matrixes were constructed for Lenna Cominos, George Darakos and Jon Nehlson (See Appendix A). From these three maps, it can be seen that Lenna, George and Jon all interact mainly with faculty and students and through them, the industry. This is because they see the importance of faculty and students interacting. To quote George Darakos, "A lot of real magic happens when you get faculty interacting together".
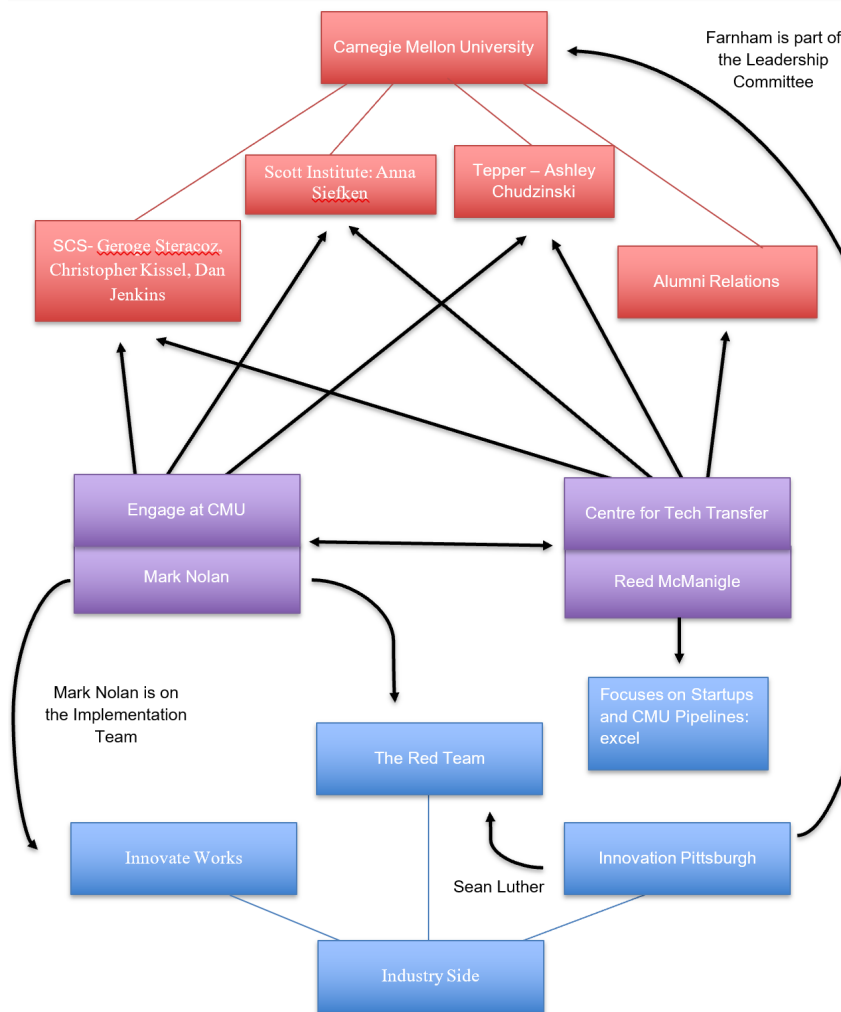
4.2.4   *The University of Michigan Model*

> **Summary Points**
>
> - UMich created a centralized, searchable database of their experts, which makes the process of finding the right researcher for a given project more seamless.
>
> - We were not able to assess the success of this system; we suspect that it makes finding an expert far easier, but it does not solve the core problem where an inadequate number of companies are seeking academic connections.

The University of Michigan has created a centralized, searchable database which allows people to find experts in various fields (see Appendix A). The database collects information from fellow Michigan Universities, partner Institutions from in-state and out-of-state institutions, and from the University of Michigan herself for a net-

Figure 4.: Matrix of connections between CMU & Corporations.

work representation of these partner institutions). Unfortunately, the constraints of this project – limited scope and lack of data from the University of Michigan – restrained our ability to create any sort of assessment of the success or failure of the University of Michigan system. It seems logical that such a database would significantly lower the costs and increase the ease of finding the right institutional connections for corporations and startups. However, it remains unclear that this is the core of the problem – it is quite possible that the challenge is not helping companies find a connection after they've already decided to find one, but rather getting companies to try and find an institutional connection in the first place. Furthermore, some of the stakeholders we've spoken with have brought up concerns about such a database; first, it would take away some elements of human control. Having companies go through actual liaison allows the liaison to find the most appropriate means of connecting the company to the institution and to give the company a thorough understanding of all of the opportunities available at the institution. Perhaps striking a balance – creating an internal centralized repository, but keeping the human touch – is the smoothest way forward.

4.3.1 *Professors*

> **Summary Points**
>
> - There is a gap between the valuable insights discovered through academic research and the insights that eventually trickle into the corporate world;
>
> - Graduate students are intently focused on publication and their narrow research focus;
>
> - There is a schism between academic & company cultures/aims, which often makes partnerships challenging.

In order to distill the interaction between the academic and corporate ecosystems, we had conversations with six CMU professors – Christina Fong, Kareem Haggag, Lee Branstetter, Mark Patterson, Saurabh Bhargava, and Silvia Saccardo.

There were a few themes which emerged from these conversations. Multiple professors noted a gap between the valuable insights discovered through academic research and the insights that eventually trickle into the corporate world; Christina Fong noted that there has been a trend of making research more accessible, but this has not yet extended to younger researchers (e.g., graduate students). Graduate students are also busy and focused on publishing their work to move on from their program; they are most available during the summer, but even then, they can't devote a lot of time to academic-corporate partnerships that aren't directly related to their work. The professors who oversee dissertations may feel adversarial towards any platform which competes for the time of their graduate students. Another factor, too, is to what extent graduate students can be trusted with holistic work – while they might have a strong foundation in the theory of decision science, it should not be assumed that they can apply theory to industry with ease.

Furthermore, multiple professors noted the difficulty of working with companies. A change in company administration often derails a long-term project; further, the often-decentralized structure of companies makes for a lot of room for competing approvals. For example, Kareem recalled working on a project for years which was shut down by the company's legal department. There already exist certain similar services, such as GLG, which connects companies with a specific issue they wish to be consulted about with expert professors. It is unclear, furthermore, to what extent companies are willing to adopt

behavioral science, and they may well require significant convincing to join such a platform.

With this feedback in mind, we maintain a few potential routes. One is to focus on shorter-term projects for graduate students, perhaps with a focus on randomly controlled trials/AB Testing, statistical analysis, computer science, and machine learning. After all, these fields are discrete and concrete, and would simplify the process of confirming the veracity of the work. Another potential option is to tailor the platform more towards undergraduate students; for the company, then, the platform would be more a means of reaching high-performing students. For students, then, the platform would provide an opportunity to connect with companies, enhance their resume, and potentially acquire new skills. Regardless of the focus, projects should be concrete, in order to easily verify success.

4.3.2 *Graduate Students*

> **Summary Points**
>
> - Decision science graduate students exhibited varying degrees of interest in partnering with businesses – three of seven students were interested;
>
> - Graduate students' interest in academic-corporate partnerships is highly dependent on their interest in applied research;
>
> - Graduate students are most incentivized by the opportunity to conduct research with typically inaccessible data sets or the opportunity to publish a paper on their research;
>
> - Many features in the current landscape of academic-corporate research relationships make such a program difficult to realize:
>   - It takes a lot of time and effort to build a successful relationship between a graduate student and a company, and success is uncertain;
>   - Differences between academia and business with regard to time horizons, culture, motives, & preferred level of precision could stymie partnerships.

We conducted seven customer discovery conversations with graduate students in CMU's Social and Decision Science Department, which is in the Dietrich College. Specifically, we sought to determine to what extent graduate students in decision sciences and similar fields would like to initiate research partnerships with businesses and what systemic problems prevent such relationships from developing. Be-

fore we conducted these conversations, we hypothesized that graduate students would generally want to initiate corporate partnerships as they could provide three primary benefits: (1) a supplemental source of income, (2) an opportunity to publish a paper, and (3) a significant resume factor.

From our conversations, we determined that graduate students are most incentivized by the opportunity to conduct research with typically inaccessible data sets and the opportunity to publish a paper on their research. Without either (or both) of these benefits, graduate students are much less likely to utilize a platform for academic-corporate research. A platform would need to clearly state the upfront and potential long-term benefits for graduate students in order to avoid taking advantage of their valuable time.

Furthermore, companies would need to clearly identify the purpose of their research. Decision science students want to know that their work is being used for purposes that align with their moral values. Many posses moral beliefs which would be contradicted by certain applications of their research. Unless the purpose of the research was clearly stated in the company's request for proposals, graduate students may hesitate to participate. We also note that research with the potential for social good may inspire participation based on altruistic motive; however, even after accounting for these considerations, many graduate students are categorically uninterested in corporate work because they would rather focus on theoretical, not applied, research.

Whether a graduate student is interested in developing academic-corporate partnerships appears to be highly dependent on the student's academic interests; students pursuing applied research would likely see greater value in corporate work, while theoretical researchers would likely see far less value in such partnerships. Furthermore, there are number of serious systemic problems that our platform would likely fail to resolve. It takes a lot of time and effort to build a successful relationship between a graduate student and a company, and success is uncertain. Based on our conversations, we learned that graduate students need to devote a significant amount of time to correspondence with companies to make success possible. Furthermore, graduate students must be constantly vigilant to translate their work from the language of academia to the language of business. Throughout the process, the student's research is susceptible to the vagaries of the corporate world. Often, a simple change in the leadership of the company can completely derail a research effort, which is the worst outcome for a student; all their hard work is wasted.

Differences between academia and business with regard to time horizons, culture, motives, and preferred level of precision could stymie partnerships. Businesses typically operate on a quarterly or annual cycle, and research efforts are typically intended to resolve

immediate or near-future issues. Therefore, they expect research partnerships to yield results far more quickly than is realistically possible. Graduate students are frequently put in a position where they have to rationalize the long-term nature of their work to an impatient employer. Furthermore, academic studies are typically more rigorous than business studies, so corporations may see the high standards of academic research as a waste of time – yet another source of potential conflict between student and company.

It would likely be difficult to engage graduate students on this platform because it's such a foreign concept and would be a significant departure for their current modus operandi. Essentially, adoption of our platform would incur high switching costs because it would necessitate a radical mental shift to how graduate students seek out corporate partnerships while they finish their degree. Currently, academic-corporate partnerships are primarily facilitated through a faculty member with deep corporate connections or when a company extends a hand to a university department; graduate students are not used to taking the lead on these relationships.

In conclusion, even if we designed a platform to facilitate academic-corporate partnerships while taking into account the feedback from these conversations, only a small subset of decision science graduate students would likely participate in this program. This platform could be more successful if we focused on graduate students in more applied, high-demand programs, as machine learning and computer science.

4.3.3 *Companies*

> **Summary Points**
>
> - Large consultancies have an average 3-4 month time-frame for contracted studies, which as expected, is very short;
>
> - Large consultancies already have significant internal resources, so they are not desperate to deepen connections with universities and graduate students;
>
> - Mid-market consumer products/services and consumer sales companies should be our beachhead market.

We conducted three customer discovery conversations with companies. Specifically, we spoke with a national managing director and a research director at Deloitte, as well as a managing director at Bain Capital. We wanted to learn about situations in which these companies might put out a request for proposals to answer decision science questions.

The managing director at Bain Capital said that the company does commission studies for their investment divisions; however, this industry research typically comes from consultancies such as McKinsey, Deloitte, and Boston Consulting, not directly from universities. The managing director also said that Bain doesn't directly use decision research for two reasons: (1) they view such work as time-inefficient, and (2) they view such research as too peripheral to their work. The managing director suggested that consultancies would make good use of academic-corporate relationships.

Balancing speed against the rigour of true academic research is of primary concern to large consultancies such as Deloitte. Studies contracted by Deloitte to external entities typically run for 3-4 months, with a maximum length of about 8 months; Deloitte prefers studies which yield results quickly. This concern is consistent with feedback that we received from graduate students about the short time-horizon that companies try to set for academic research. The Deloitte directors also told us that one key pain points is their inability to trust research contractors. In particular, Deloitte would like to verify (upfront) that the experimental design and data analysis plan for a study are robust, yet are currently unable to do so effectively.

Large consultancies already have significant internal resources, so they have no burning desire to deepen connections with universities and their graduate students. However, the national managing director at Deloitte did recognize the benefit of initiating relationships with graduate students which could become a valuable talent pool for future Deloitte recruitment.

Finally, the Deloitte research director with whom we spoke told us that Deloitte might use our service if it were fully built-out, but we would have an easier time working with mid-market consumer products/services and consumer sales companies. While we did not conduct a customer discovery campaign for this market, we strongly recommend that future research explore the viability of academic-corporate partnerships with mid-market consumer products/services and consumer sales companies.

CONCLUSION

We began this project based on a shared goal: to imbue public policy with academic research. The schism which we initially identified remains a potent social problem – all too often, our policy is informed not by research, but by concentrated political and economic interests. Fundamentally, this is not an informational problem, but a problem of incentives; democratic politicians are incentivized to tend to the concerns of the powerful few, not the whispering masses. Our research led us to uncover a number of systematic issues that currently plague the development of academic-government partnerships.

Then, we analyzed the potential for a platform which would connect the academic and corporate worlds, to facilitate the transfer of intellectual capital, and provide for those who devote their lives to the creation of intellectual capital. Here, too, we found enormous potential and difficulties – the issues of vastly different culture and motive pose significant roadblocks. We do not have one big idea to solve the issues we've encountered – but this report does lead us towards a few potential pathways.

First, we mustn't overlook state and local governments. A significant proportion of policy is written not on the national level, but in state legislatures and city and town councils. On the national level, politicians are inundated with information from think-tanks, interest groups, lobbyists, and passionate citizens. This is often, but not always, the case in lower levels of government; thus, any sort of informational intervention should be aimed towards these levels of government. A program that facilitates connection, trust, and exchange between academia and policy could be successful in shifting the Pittsburgh Public Schools Board of Education to support a research-based recess policy, convincing aspiring Pittsburgh city council candidates to advocate for smart city policies, and pushing election cybersecurity measures through the Pennsylvania state legislature.

Second, any sort of program that seeks to bridge the divide between academia and the public or private sector must focus in large part on motive and culture. Academics are generally motivated by publication and they are typically idealistic, with genuine intellectual curiosity; corporations are motivated by profit. Government officials are driven by elections, and therefore by concentrated over dispersed interests. Academics tend to operate more slowly, with a focus on long-term research; this even trickles down to their everyday tendencies – academics prefer email, for instance, over phone calls. The

private sector is more fast-paced and quarter-oriented; corporations often favor calls over email. Any meaningful attempt to bridge the gap must reconcile these differences in culture and motivation.

One promising idea that originated in this project is the opportunity for a better system to connect professors or graduate students with undergraduates, to conduct small research projects. Professors and graduate students frequently struggle to quickly and reliably get access to undergraduate research assistants. Similarly, we suspect that undergraduate students would welcome better access to employment opportunities where they can learn new skills and network with professors/graduate students. This platform would be initially limited to the students and faculty of one university (e.g., Carnegie Mellon University), before expanding to other schools.

Our brainstorm-prone tendencies aside, the issue of a city-on-a-hill academic system does hold back the implementation of scientific research. An increasingly active and aggressive private sector is building bridges to great academic institutions at a rapid pace, but the government is slower to acquire and implement research. This is an interesting problem which necessitates further inquiry, and approaching this issue thoughtfully and systematically will yield real benefits in enacting policies of intended impact.

6

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APPENDIX

A.1 MICHIGAN MODEL

A.2 WORKING BUSINESS MODEL CANVAS FOR ACADEMIC-GOVERNMENT PARTNERSHIPS

The document is located on the next page.

Working Business Model Canvas

Ripples Project

- **Key Partners**
  - Key Partners: The organizations, rather than the individuals within the organizations.
    - Academic Institutions
      - Universities
      - Academic interest groups
      - Government subgroups that do academic research
    - Policy-making institutions
      - Legislatures
      - Administrative offices
      - Unions
      - Non-profits
      - Think tanks
  - Key Suppliers: our suppliers are also one segment of our customer-base
    - Academics and Academic Institutions
    - They provide/generate the policy proposals
  - Key Resources from partners
    - Access intellectual capital
    - Access to networks of policy-makers
    - Access to networks of academics
  - Key Activities partners perform
    - Working with policy-makers to draft & implement policies
    - Working with academics to draft & implement policies
    - Teach us the structure of the research <--> government pipeline
    - Marketing of our work and product
    - Influence the overall conversation of whatever industry the customer is associated with.
- **Key Activities**
  - Related to Value Propositions
    - A policy maker would need to identify a problem and not know what policy to look for. Alternatively, they may be dissatisfied with the status quo. It would need to be their goal to have the policy backed up by research.
    - An academic would need to take some of their research and translate it into a short policy statement/proposal, and then post that proposal on our platform
  - Distribution Channels: "The manner in which goods move from the manufacturer to the outlet where the consumer purchases them; in some marketplaces, it's a very complex channel, including distributors, wholesaler, jobbers, and brokers."
    - Communication

- ● Academic Institutions
- ● Policymaking Institutions
  - ○ Partisan or non-partisan?
  - ○ Legislatures, executive & administrative offices
- ■ Providing value
  - ● To start...
    - ○ Email
    - ○ Face-to-face meetings
    - ○ Distill academics' ideas into a condensed, short, easily-understandable format
  - ● Later…
    - ○ Online platform
    - ○ We will be a matchmaker
- ○ Customer relationships
  - ■ Current relationship: We are starting manually
  - ■ At some point in the future we need to decide: (1) manual, personal management of these academic-policymaker relationships, (2) AI, online prescriptive platform
- ● **Key Resources**
  - ○ Distribution Channels: What key resources do the distribution channels require?
    - ■ Partnerships with specific policymakers & academics
    - ■ Partnerships with policy-making and policy-designing organizations (lobbyists, research groups, legislatures, administrative offices, and others)
    - ■ Partnerships with academic institutions
  - ○ Customer relationships
    - ■ Develop trust that our content is accurate, reliable, and useful
    - ■ A way of managing connections and maintaining them
  - ○ Sustainable Revenue streams
    - ■ User base
    - ■ Grant submissions
    - ■ Develop a revenue model
- ● **Value Propositions**
  - ○ Policymakers: Accessible and convenient platform to find issue-specific talent
    - ■ Save time (spent evaluating policy on your own, or looking for talent)
    - ■ Save money (spent paying various experts)
    - ■ Leverage more innovative policy ideas which policymakers otherwise wouldn't
  - ○ Academics: Implement your policy & gain valuable government connections
    - ■ If you already wanted to implement your policy…
      - ● Centralized (convenient) platform to connect with policy-makers
      - ● Save time &, potentially, money
    - ■ If you weren't planning on implementation…
      - ● Collect valuable data
      - ● Make your name known in policy-making world
      - ● Get government citations & connections

- ● Potential for future consultancies
- ● Potential for international influence?
- **Customer Relationships**
  - ○ We don't really know what kinds of relationships academics and policy-makers expect us to establish with and between them
    - ■ They will most likely initially expect personal, one-on-one relationships
  - ○ We have already established loose relationships with a number of CMU professors
  - ○ We're expecting to build relationships with policy-makers in the Pittsburgh area and connect them with the CMU (and possibly Pitt) professors we have access to already. At the same time, we hope to build broader relationships with other areas of the country (and eventually the world) to see if the project can function in other regions.
- **Channels**: How do we reach our customers?
  - ○ In our current state, we are the ones building relationships. We are finding the policy-makers and the academics, and then connecting the two parties. In the future, customer acquisition will be facilitated by former customers who will refer us to others and online search results.
  - ○ Customers probably want to be initially reached one-on-one via email or phone; this is how they're used to doing things.
  - ○ Currently, we are reaching academic contacts via email and have not really reached out to policy-makers; when this happens, we will communicate via email
  - ○ Using academic & policy-making institutions to reach academics & policy-makers will ideally be cost-effective and efficient.
  - ○ In the long-term, using an online platform to connect academics and policy-makers will also help improve cost-efficiency.
- **Customer Segments**
  - ○ Academics
  - ○ Policymakers
    - ■ Probably legislators or executive offices, not regulators
- **Cost Structure**
  - ○ Time: Setting up these relationships w/ customers (one-on-one) will take lots of our time and is not a scalable model. Currently, it is our most significant cost.
  - ○ Creating platform: we eventually need to hire software developers to build the website (most likely)
  - ○ Optimizing policy pipeline (time): We need to figure out the best way to connect academics & policy-makers and potentially pay people, in the long-term, to invest that time for us. Currently, it is our own time that is going into this process.
  - ○ Partnering with institutions (time): We need to find the right academic and policy-making institutions and develop a collaborative plan; they also might charge us for access to their network.
  - ○ Allocating grants to academics: Not expected soon.
- **Revenue Streams**
  - ○ Allow private parties on the platform, pay consulting fee
    - ■ Often times, professors will have their own independent consulting "firms"

- Institutions pay for "premium"
  - More visibility
- Individuals pay for "premium"
  - More connection
  - More visibility
- Donations & partnered orgs
  - Need to try and stay nonpartisan
  - Maybe take money from both sides of the aisle?
- Nonprofit Funding:
  - SURF/SURG
  - Schwartz?