

**IMPROVING ACCESS AND INCLUSIVITY
IN THE PATENT SYSTEM: UNLEASHING
AMERICA'S ECONOMIC ENGINE**

HEARING
BEFORE THE
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PROPERTY
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C O N T E N T S

APRIL 21, 2021, 10:00 A.M.

STATEMENTS OF COMMITTEE MEMBERS

	Page
Leahy, Hon. Patrick J., a U.S. Senator from the State of Vermont	1
Tillis, Hon. Thom, a U.S. Senator from the State of North Carolina	2
Durbin, Hon. Richard J., a U.S. Senator from the State of Illinois	4
Hirono, Hon. Mazie, a U.S. Senator from the State of Hawaii	5

WITNESSES

Witness List	25
Edwards, Georgia Grace, co-founder, SheFly, Burlington, Vermont	7
prepared statement	26
Grayson, Angela J., founder and principal member, Precipice IP PLLC, Bentonville, Arkansas	9
prepared statement	30
Mtima, Lateef, professor of law, Howard University School of Law, Wash- ington, DC	12
prepared statement	54
Yen, Mallun, founder and partner, Operator Collective, Woodside, California ..	11
prepared statement	50

QUESTIONS

Questions submitted to Georgia Grace Edwards by:	
Senator Tillis	61
Questions submitted to Angela J. Grayson by:	
Senator Leahy	53
Senator Tillis	62
Questions submitted to Lateef Mtima by:	
Senator Leahy	59
Senator Tillis	63
Questions submitted to Mallun Yen by:	
Senator Leahy	60
Senator Tillis	64

ANSWERS

Responses of Angela J. Grayson to questions submitted by:	
Senator Leahy	65
Senator Tillis	67
Responses of Lateef Mtima to questions submitted by:	
Senator Leahy	69
Senator Tillis	69

MISCELLANEOUS SUBMISSIONS FOR THE RECORD

Appendix A of Engine's Response	86
Appendix B to Engine's Response	117

IV

	Page
Engine Letter, April 20, 2021	123
Intellectual Property Owners Association Letter, April 16, 2021	135
Intellectual Property Owners Association Statement	130
Invent Together, Statement of Holly Fechner, April 21, 2021	74
Ron D. Katznelson Letter, April 19, 2021	133
Statement of Jeff Hardin and Patricia Duran, April 21, 2021	125

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WEDNESDAY, APRIL 21, 2021

UNITED STATES SENATE,
SUBCOMMITTEE ON INTELLECTUAL PROPERTY,
COMMITTEE ON THE JUDICIARY,
Washington, DC.

The Subcommittee met, pursuant to notice, at 10 a.m., in Room 226, Dirksen Senate Office Building, Hon. Patrick J. Leahy, Chairman of the Subcommittee, presiding.

Present: Senators Leahy [presiding], Hirono, Tillis, and Blackburn.

Also present: Chair Durbin.

**OPENING STATEMENT OF HON. PATRICK J. LEAHY,
A U.S. SENATOR FROM THE STATE OF VERMONT**

Chair LEAHY. Good morning, everybody. I will say again as I have said many times, I will be glad when we can come back to having regular hearings where—our witness professor, we are not trying to put you almost in the empty room. It is the way we have to set it up.

I think what we are talking about today though, is something that is amazing. The fact that our founders had the foresight to anticipate the power of innovation when they wrote the Constitution. They put the Intellectual Property Clause in the text of the Constitution. I think our founders set a young nation to become the most powerful and forceful economy on the face of the Earth. Just a few simple words created incredible incentives and led to the developments of life-changing inventions ranging from Kevlar to the microchip to pharmaceutical advances. More than 200 years since our Constitution was ratified, we still have not reaped all the benefits of having the greatest innovative economy in human history. That is because we have not done enough to tap into the diverse segments of our society that are brimming with brilliant ideas to change the world. I think America's economic engine still remains to be fully unleashed.

The first patent issued in the United States, often attributed to Vermont, was issued to Samuel Hopkins in 1790, but then it would be 19 years before the first woman received a patent. It would be 31 years before the first African American received a patent. This demographic disparity in the patent system is one that continues to this day into the 21st-century. A recent U.S. Patent and Trade-

mark Office, the PTO, found that only 22 percent of U.S. patents list a woman as an inventor, even though women make up more than 50 percent of our population. Other studies have found that African Americans apply for patents at about half the rate of white Americans. That means we are not reaching our full economic potential.

A study by Michigan State University's Lisa Cook found that including more women and African Americans in the innovation that leads to patents could increase GDP per capita by as much as 4—almost 4.5 percent. There are other benefits to increasing participation among underrepresented groups. As Georgia Grace Edwards who will testify remotely today—she is from the Vermont based SheFly—can attest, if you bring different perspectives into the innovative ecosystem, you get unique ideas that other inventors may never have considered. The genius of the American people, the diverse genius, is one of our greatest resources. We have to improve access to the PTO.

Ten years ago Congress enacted the Leahy-Smith America Invents Act. It was the first and most significant update to the patent laws in nearly 60 years. I am proud of the effort we took on that law to boost accessibility to the patent office, but we also knew, both Congressman Smith and I and the Republicans and Democrats who joined with us, knew that was a first step. We created a network of PTO satellite offices around the country bringing them closer to where Americans actually innovate. We lowered fees for small businesses. We created a new micro entity status to lower fees even further. We also created the Patent Pro Bono Program to help make legal resources more accessible to prospective inventors.

We know we can improve the crux of demographic data to the PTO to give us more insight into the disparities that exist in the innovation ecosystem. That is why I was proud to cosponsor Senator Hirono's bipartisan IDEA Act which would allow the PTO to collect demographic data from patent applicants on a voluntary basis. Senator Hirono is a leading voice in the Senate for improving diversity in the patent system.

We have to find ways to improve diversity in the patent system. It is the right thing to do, but it is also—economically it is a great way to boost economic output in our country, and it has been a bipartisan issue and an important focus of this Subcommittee. I want to praise Senator Tillis for the work he has done. I have been in a number of the hearings he has held in this. He has worked very, very hard on this subject. I am proud of him. He is a good friend. I look forward to working with him and other members of the Subcommittee. I hope by praising Senator Tillis I have not brought about political downfall for him in his state, but I mean the praise and I yield to the ranking member, former chairman.

**OPENING STATEMENT OF HON. THOM TILLIS,
A U.S. SENATOR FROM THE STATE OF NORTH CAROLINA**

Senator TILLIS. Thank you, Mr. Chairman. I appreciate you holding this hearing. It is a very important topic. I know it is important to you and to me and, most importantly, it is a key area of consideration for the American innovation economy. I also want to con-

gratulate you on becoming the Chairman. I look forward to your leadership in this Subcommittee.

I have to say you have to be one of the most prolific legislators in the area of intellectual property. I do not think it is an understatement to say that since the founding fathers laid the groundwork and the Constitution, you stand among only a handful of Senators that have invested so much time in it and I appreciate it. Looking forward to working with you and learning from you and I am excited about what we can accomplish together with a number of members on the team.

Like the Chairman and many members on the Committee, I am committed to increasing diversity in our Nation's intellectual property system. For too long men—I am sorry—women, people of color, the LGBTQ community have simply been underrepresented in our innovative system. In this scenario is where I have some experience. About 24 years ago, after I was admitted to the partnership at Pricewaterhouse, I had my senior managing partner come to me and say, "I think that we need to focus on diversity." I think his idea of diversity was probably the African American community, but I asked him would he let me take some time to propose a framework and come back to him.

In 1997, I proposed a diversity recruiting initiative that went after HBCUs, the African American community, underrepresented minorities, and the gay and lesbian community. In a few short years, the number of highly talented people we got from that diverse group was extraordinary, and they ranked among some of the best professional staff that I ever had the privilege to manage as a partner.

Today we have got the same problem in our intellectual property system and they are underrepresented, and the American economy suffers as a result. They often face unique barriers engaging in intellectual property system, and their lack of access costs us billions of dollars a year. The evidence presented by the USPTO and others clearly demonstrates inequality in the patent system. It is past time that we take steps forward to ending inequality and redouble our efforts to improve the livelihoods and the well being of all Americans.

I have been proud to work with Senators Hirono, Coons, you, Mr. Chairman, and Senator Durbin on efforts to increase diversity in the patent system. I was glad to see we recently reintroduced the Inventor Diversity for Economic Advancement IDEA Act this year. This bipartisan, bicameral legislation will allow us to better understand the background of individuals who apply for patents and gain a better understanding who apply for patents for the USPTO.

I am hopeful we can move to a markup on this legislation and get it signed into law. I am interested in hearing from today's witnesses on other efforts we can take, no matter how big or small, to increase diversity and engagement in the intellectual property system. Thank you all for being here today. I look forward to your testimony.

Mr. Chairman, if I could have just a moment of privilege, I would like to introduce a new member of my staff. We all know that the staff do the lion's share of the work and I want to introduce my newest team member. Her name is Susan Allen. She joins the team

as a detailee from the USPTO where she was an attorney advisor for the Office of Policy and International Affairs. Susan has a wealth of experience in intellectual property law in both the public and private sector. She is one of the Federal Government's recognized experts in copyright law, and I am glad to have her on my staff. She is already doing great work, and I am excited to work with her. She actually wrote a portion of my opening statement, and it was brief, so I know she is going to work well in my staff. Maybe afterwards, Mr. Chairman, I can introduce you personally, but she is sitting here right behind me with Brad.

I also want to say thanks to Senator Coons' staff. He was a joy to work with in the Intellectual Property Committee. The staff to staff relationship was great, and that is how we get things done. Thank you, Mr. Chair.

Chair LEAHY. Thank you, and I will be talking about a couple of our staff a little later on because one of the things I have learned in the number of years I have been here is that Senators are merely constitutional impediments to the staff. Thank God we have such good staff in both parties.

We are privileged to have the Chairman of the Senate Judiciary Committee here and I will yield to him.

**OPENING STATEMENT OF HON. RICHARD J. DURBIN,
A U.S. SENATOR FROM THE STATE OF ILLINOIS**

Chair DURBIN. Thanks, Senator. Thank you for giving me an opportunity to be here today to salute you and Senator Tillis for your leadership in calling this hearing. Let me echo Senator Tillis and his praise for his new staff member and staff member's brevity. It goes back to a couple of things that I remember people have said. "I am going to send you a long letter because I do not have time to send you a short one". Then the exhortation which Muriel Humphrey made to Hubert Humphrey who said, "Your speech does not have to be eternal to be immortal." I think we all take that advice and try to live by it and thank the staff for helping us reach those goals.

I spent a lot of my time studying intellectual property and entrepreneurship by watching Shark Tank and I hope some of you do too. I think it is an exciting and interesting program. I have met the fellow who runs it, Mark Cuban, several times. How often do they ask these prospective entrepreneurs, "Have you filed for a patent? What is the status of your patent application?" You come to realize that good ideas are stolen almost immediately and there has to be some protection. They recognize that in the Constitution. You recognize it here today.

As you mentioned, Senator Tillis, we have your bill with Senator Hirono, the IDEA Act, which I hope to report out of this full committee quickly. I also want to commend Senator Kennedy. He and I teamed up to pass small claims resolution for copyright cases. I hope that we can see that implemented soon by the rules and regulations. You have an exciting panel of witnesses and I do not want to delay any further getting to them this morning, so thank you.

Chair LEAHY. Thank you, Mr. Chairman. I appreciate the fact you are going to bring up that piece of legislation soon before the

Committee. I have a feeling we are going to get strong bipartisan support.

We have—is Senator Hirono here?

Senator HIRONO. Yes.

Chair LEAHY. Oh, she is. I am sorry. Senator Hirono.

Senator HIRONO. I am here virtually.

Chair LEAHY. I looked around the room for you and I am sorry. I realized you are going to be virtual. We were praising you and your work.

Senator HIRONO. I heard.

Chair LEAHY. I yield to Senator Hirono.

**OPENING STATEMENT OF HON. MAZIE HIRONO,
A U.S. SENATOR FROM THE STATE OF HAWAII**

Senator HIRONO. Thank you so much. I join you and Ranking Member Tillis in welcoming our witnesses in today's hearing on the need to improve access and inclusivity in our patent system, a topic that gets too little attention, present company excepted. I really enjoyed Chairman Durbin's remarks, especially his reference to Shark Tank, because in one of the episodes a young girl from Hawaii got funded for her invention of a spoon to feed babies.

We all know that women and minorities have made some of the most significant inventions in history. Can you imagine driving a car without windshield wipers? Invented by Mary Anderson in 1903. What would we do without the home security system invented by Marie Van Brittan Brown in 1966? The genetic revolution would still be science fiction if not for the CRISPR gene editing tool discovered by Nobel Prize winner, Jennifer Doudna, raised on Hawaii Island.

We should celebrate these diverse inventors and the many others who have contributed to innovation in this country, but we must also recognize the hard truth that women and minorities are greatly underrepresented in the U.S. Patent system. The Patent and Trademark Office's 2020 report on women inventors found that only 22 percent of U.S. patents list a woman as an inventor and that women make up only 13 percent of all inventors. For comparison, women held 48 percent of all full-time jobs in 2019. Even if we focus on the STEM careers most likely to generate patents, we still see a gap. Women make up approximately 27 percent of the STEM work force in 2019, a number that greatly exceeds the 13 percent of inventors that are women.

Racial patent gaps also exist. For example, a report by the Institute for Women's Policy Research found that the percentage of African American and Hispanic college graduates who hold patents is approximately half—half that of their white counterparts. Closing these gaps would turbocharge our economy. According to a study by the Michigan State University professor, Lisa Cook, including more women and Black Americans in the initial stage of innovation could increase GDP by as much as \$640 billion. Another study by the National Bureau of Economic Research found that eliminating the patent gap for women with science and engineering degrees alone would increase GDP by over \$500 billion.

It is simply good policy and good business to make our innovation economy accessible to all. Thankfully, both Congress and the

PTO have taken steps to start addressing these patent gaps. In 2018, Congress passed the Success Act, a bill I cosponsored, that directed the PTO to study the number of patents applied for and obtained by women, minorities, and veterans. The PTO's subsequent report contained a number of suggestions we can take to address the underrepresentation of these groups. The PTO also launched its National Council for Expanding American Innovation, an initiative tasked with guiding the PTO and developing a comprehensive national strategy to build a more diverse, inclusive innovation ecosystem. I look forward to hearing from our witnesses about the progress the National Council has made.

Even with these efforts, there is much more we can and should do. I thank Chairman Leahy and Ranking Member Tillis in working with me to reintroduce the Inventor Diversity for Economic Advancement or IDEA Act. This bipartisan legislation comes from a recommendation in the Success Act report that I referenced and would direct the PTO to collect demographic data from patent applicants on a volunteer basis and issue regular reports on the data collected. This would give us greater incentive to what patents gaps exist and how to address them.

The Judiciary Committee should vote on the IDEA Act next week. I hope the bill will pass this Committee with strong bipartisan support so we can consider and pass the bill in the Senate. Last year, Senators Tillis and Coons joined me in a letter to the PTO Director Iancu asking the PTO to look into the underrepresentation of women in the Patent Bar. We actually have a bar, specialty bar, for patent lawyers. I do not know if this was Ms. Edwards' experience, but sometimes it takes a woman patent attorney to appreciate certain inventions. I am glad the PTO is already taking action to ensure the Patent Bar membership is accessible to all qualified candidates. I look forward to seeing this work continue.

We can also encourage more women and minorities to pursue STEM careers. Last Congress, I introduced two bills: the STEM Opportunities Act and the Women and Minorities in STEM Booster Act aimed at improving the recruitment, retention, and success of women and minorities at all stages of the STEM pipeline. I hope my colleagues will join me in cosponsoring these bills in this Congress. I do add that, you know, we talk about wanting more diversity and representation by women and minorities. All of this does not happen because we think it is a good idea. We can take actual steps, concrete steps, to make these happen.

I have mentioned some of the few steps we can take to increase diversity in our patent system. Once again, I thank you, Mr. Chairman, and Ranking Member Tillis for calling this hearing. Mahalo.

Chair LEAHY. Thank you, Senator Hirono. I look forward to your legislation coming up soon, and I think this may be something that shows the Senate can be bipartisan with the work that you and Senator Tillis and others have done on that, and I look forward to seeing us vote on it on the floor, and I applaud you for that.

We are going to have—our first witness is Georgia Grace Edwards. She is the co-founder of the Vermont based women's apparel company, SheFly. In addition to her work starting SheFly, Ms. Edwards is an economic consultant in Boston. She has worked

as an Alaskan glacial guide. She was a Fulbright Fellow in the Czech Republic. She is a graduate of Middlebury College in Vermont. I think she has an interesting story to tell and she is going to be here virtually, I believe to testify from Arizona. Ms. Edwards, you are on.

**STATEMENT OF GEORGIA GRACE EDWARDS,
CO-FOUNDER, SHEFLY, BURLINGTON, VERMONT**

Ms. EDWARDS. Good morning. I would like to start by thanking Senator Leahy and his staff for their work to improve access and inclusivity in the U.S. patenting process. This push for greater diversity and outreach efforts in American intellectual property is an initiative with the potential for tangible effects, not just on our small businesses in Vermont, but on individuals and businesses across our Nation. I am only 25 years old, but I have a feeling that this opportunity to share my experience as an American entrepreneur and inventor will be among the greatest honors of my life, and I am very grateful to you all for having me here today.

SheFly is a layerable line of outdoor pants for women that allow us to comfortably, safely, and easily answer nature's call, quite literally speaking, without exposing skin to the elements or other people. Our patented technology features a zipper and accompanying flap, which begin at the base of the zipper we are accustomed to using to get our pants on and off and extends all the way to the back of the pant, so that the user can control the size and location of the space they need to create. Through this design, we are able to help the one in three women who have had a bathroom accident in the past year while adventuring outside, a statistic that has presumably only increased during the COVID-19 pandemic as more Americans have taken to the outdoors and more public restrooms have closed.

As a Vermont small business owner, my ability to protect my ideas as well as those of my co-founders, Bianca Gonzalez and Charlotte Massey, was crucial to our ability to scale and succeed. Patenting is extremely central to our business model. In our country's vibrant and highly competitive startup ecosystem, patents make or break an entrepreneur's ability to signal legitimacy in a market, gain new customers, establish additional revenue streams, and achieve a favorable valuation with investors.

More importantly, our patents are what will allow us to bring our technology to people in all different sectors. Not only rock climbers, hikers, and mountaineers, but also field scientists, ski patrollers, farmers, bridge inspectors, international aid workers, park rangers, people who use wheelchairs, and women on the front lines of our military. Women risking their lives to protect American citizens have more important things to worry about than when and where they can next relieve themselves. They deserve the top technology our society has to offer, and patents increase the reach of good ideas and the number of people in our society who can benefit from them.

Intellectual property rights do not come easily, especially for traditionally underrepresented groups. My hope is that by sharing SheFly's experience, we can work together to make the patenting path a bit smoother for those who will walk it next, especially for

those who do not currently see themselves reflected in the process. In navigating that patenting and trademarking process, SheFly faced three specific interrelated barriers: the representation barrier; the knowledge barrier; and the financial barrier. These obstacles operate in a positive feedback loop, further entrenching detrimental cycles that prevent the U.S. from effectively taking advantage of the brilliant ideas that everyday Americans have to offer.

For an entrepreneur, the initial steps in building a company involve talking to people, cold calling, putting out feelers, making connections with those who have been through it before and can advise on helpful contacts and tips. In the Middlebury Entrepreneurs class where I built out SheFly, I spent an entire month doing just that and was unable to find a single person with my background who had been through the IP process in my industry. In fact, I did not talk about patenting with anyone who was not a wealthy, white, middle-aged male in the field of engineering or tech. The power of representation is greatly underestimated. When you do not see people who look like you doing something you wish to do, it makes you question whether it is even possible in the first place.

Patenting in the U.S. is an extremely intimidating, long, and clunky, and opaque process. That is my kindly worded, highly edited description of the process. IP law is a very niche body of knowledge. It is hard to teach yourself. The lack of access to centralized resources with clear, digestible information on the patenting process that is specific enough to help gauge particular needs and likelihoods of obtaining IP necessitates hiring patent attorneys.

If you think you have spent a lot on the coronavirus relief bill relative to your overall budget, you should see how much SheFly has spent on legal fees over the course of the past two and a half years. There have been points in time when we have spent well over 50 percent of our revenue on legal fees to cover the immense amount of labor and cost associated with filing. From a basic economic standpoint, the long term upfront investment in IP is one that is often directly at odds with the short term realities of startups and small businesses. Due to the high cost and low probability of reward through patent approval, entrepreneurs are not incentivized to pursue IP in our current economy.

In closing, I would like to emphasize that any proposed legislation that fails to recognize and address the representation, knowledge, and financial barriers to innovators will be incomplete. I envision a world where one day women and girls do not have to think twice about answering nature's call, nor about their ability to participate in the U.S. economy as inventors, entrepreneurs, and small business owners. I and so many others are counting on you to change the traditional narrative of entrepreneurship in America. Thank you.

[The prepared statement of Ms. Edwards appears as submission for the record.]

Chair LEAHY. Thank you very much. I will put your full statement and your background in the record. It is worth reading. I would note that it has been read carefully by my wife, my daughter, and two of our granddaughters, and soon the third one will be reading it. Thank you very much.

Our next witness is Angela Grayson, the founder and principal member of Precipice IP. It helps entrepreneurs and technology focused businesses protect their products and brands, designs, data. Prior to founding Precipice, Ms. Grayson was associate general counsel for intellectual property, patent operations lead at Wal-Mart stores. She also served as a patent examiner. She is currently chair of the American Intellectual Property Law Association Diversity in IP Law Committee.

Ms. Grayson, you are also reaching us remotely. Go ahead, please.

**STATEMENT OF ANGELA J. GRAYSON, FOUNDER
AND PRINCIPAL MEMBER, PRECIPICE IP PLLC,
AMERICAN INTELLECTUAL PROPERTY LAW ASSOCIATION,
BENTONVILLE, ARKANSAS**

Ms. GRAYSON. Thank you. To the Chair, Senator Leahy, Ranking Member Senator Tillis, distinguished members of the Intellectual Property Subcommittee, I appreciate the opportunity to present the views of the American Intellectual Property Law Association on improving access and inclusivity in the patent system.

My name is Angela Grayson. I am a technology lawyer. I am the rare woman of color who is also a registered patent attorney. I am here to represent the views of AIPLA where I presently serve as chair of the Diversity in IP Law Committee and the views I express today are not my clients.

Founded in 1897, AIPLA is a national intellectual property bar association with approximately 8,500 members. We are engaged in private and corporate practice, government service, and academia. In recent years, objective indicators revealed the United States' standing in innovation is changing. Our nation's leading agencies, namely the Department of Commerce and the USPTO, have considered a national strategy to counter this change. To this end, the National Council for Expanding American Innovation was established with the strategic purpose to develop new ways to expand innovation. The Council's role is to tap into the strength of our Nation's diversity and find ways to increase opportunities for all Americans to participate in our innovation system.

Data continues to show that diverse teams achieve better results. Yet, women and socially and economically disadvantaged individuals comprise a small fraction of innovators who apply for and obtain patents. The reality is that women and people of color are innovating, but many do not take the next step to patent because they face a variety of barriers. This lack of participation in our patent system is a problem for all of us because it is well accepted that innovation used effectively can grow economies. The more innovators opting into our patent system, the greater the capacity for our economy to grow.

To support our diverse innovators opting into our patent system, we need to actively acknowledge the creativity and ingenuity of diverse populations. It is not enough to simply educate, but we must acknowledge and celebrate diversity because doing so we can catalyze and unleash the creativity and value of others.

Next, we should empathize with the challenges faced by diverse populations. We believe it is important that everyone participating

and contributing to innovation is recognized in value for their contribution. As an example, in-house professionals can employ empathy to identify women and people of color to uncover hidden and lost Einsteins, people who possibly should have been listed on invention disclosures, but were not. Understanding and empathizing with the challenges faced by innovative women and people of color can help in assessing and elevating innovation through these individuals to drive our Nation's economic engine.

Last, we must activate resources, both human and material, in particular for those diverse populations which may be unaware or may lack the confidence to use. The USPTO, the legal community, states, and other players in the innovation ecosystem have amassed many, many resources for innovators. However, simply because a resource exists does not mean that the intended recipient will discover it.

When the "Lost Einsteins" hearings took place before this Subcommittee in 2019, it was surprising to hear in some of the testimony that a number of women and inventors of color believed few resources, both legal and financial, existed that could assist them in their quest to protect their intellectual property. We believe substantial resources do exist to assist inventors. For example, Patent Pro Bono, the SBA, SBA-backed Entrepreneurial Support Organizations, SBIR, STTR programs, and the USPTO's phenomenal educational programming, to name a few.

While these are not specifically targeted to women and people of color, early indicators suggest these initiatives are already positively impacting these communities. Many other public, private, government, state, and legal organizations do their part as well to help in sharing their time, talent, and resources to remove barriers in our innovation ecosystem. However, disconnect still remains particularly with respect to women, helping people of color, and socially economically disadvantaged groups learn what resources, both human and material, are available to assist them. Outreach, education, mentoring, and awareness are so vitally important here.

AIPLA appreciates the substantial effort of this undertaking by the Subcommittee and the opportunity to participate in the development of a very important dialogue on how to improve access and inclusivity in our patent system. We will continue to be engaged and lead the way on this issue and we are willing to respond to any questions that you may have. We look forward to working with this Subcommittee on this important challenge as circumstances allow. Thank you.

[The prepared statement of Ms. Grayson appears as a submission for the record.]

Chair LEAHY. Thank you very much. Again, like all witnesses, a full statement or additional material will be put in the record.

Mallun Yen is the founder of Operator Collective. That is a venture capital fund focusing on opening the venture ecosystem for tech leaders from diverse backgrounds. She has previously built three other companies, is a founding member of ChIPs. It is a non-profit that advances and connects women in technology, law, and policy. She will also be joining us remotely. The floor is yours, Ms. Yen.

**STATEMENT OF MALLUN YEN, FOUNDER AND PARTNER,
OPERATOR COLLECTIVE, WOODSIDE, CALIFORNIA**

Ms. YEN. Thank you, Chairman Leahy, Senator Tillis, and other members of the Committee.

I have spent my career furthering innovation, starting with patents and now working with startups, so I am an unusual combination of IP attorney, operator, founder, and investor. Because there tends to be more data on women, for shorthand today, I refer to women as a proxy for women, people of color, and other underrepresented groups.

As mentioned, for many years I was the VP for Worldwide Intellectual Property at Cisco. When I was promoted to that position in 2005, there were so few women chief patent counsels that it was front page news. That led all seven of us to start a nonprofit called ChIPs, which is now the world's largest organization for women in patent law with almost 4,000 members in 17 chapters around the world. My ChIPs cofounder, Michelle Lee, was the first and still only woman and the first and still only person of color to serve as a Senate-confirmed director of the PTO in its 219-year history. I then built a startup called RPX that helps companies reduce and insure against patent risk. I am also a member of the NCEAI.

A few years ago I actually invented something. It is called the collective venture model, which serves as the basis of my current startup, a venture fund called Operator Collective. If you spend any time at all with startups, it is hard not to notice that the venture world revolves around VCs, or venture capitalists, and founders. Both are homogenous groups, which at the time were about 90 percent male, predominantly white, and 40 percent of whom actually went to Harvard or Stanford.

Having been a founder, an investor, and an operator, I saw a huge missing piece, which are operators. Operators are those who are often not the founders, but the ones brought in to build and scale the companies as they grow. They are typically not in the limelight, but the ones who are quietly working in the background. Here are these wildly experienced operators who have exactly the right skillsets to help businesses grow and thrive, but they are typically left out. Most people are not trying to exclude these operators. It is just that the system was not built for people who give 150 percent to their day job and use any time left over for their families.

I knew that operators were the missing piece, but since the traditional model did not work for them, I created a new model that would, rebuilt it from the ground up to optimize for bringing in busy women operators. To do so, we added three things: education, accessibility, and representation. We knew women operators did not have ready access to the right information, so we created short, enjoyable programs. We knew that a big hurdle was the cost of entry, so we created a sliding scale for financial participation. Another obstacle was time, so we made it flexible by crowdsourcing deals and diligence and creating redundancies. We knew that women are often criticized for self-promoting, so we built a supportive community that does it for them.

In short, instead of making women conform to a rigid, traditional construct, we changed the system to make it easier and more user

friendly for women. Today our \$51 million fund has over 130 operator investors who are 90 percent women, 40 percent people of color, and over 70 percent of them had never invested in venture before.

There are several parallels to the patent world. Securing a patent, as we heard, is complex, daunting, expensive. You have to learn a system that uses terms outside of everyday language. You need to dedicate time on top of your day job and your family obligations. You have to have the financial means to hire an attorney or an agent. The system was not built for adventurers like Ms. Edwards. If we want to capture the innovations that reflect the contributions of all of America, we need to evolve the system. And so that includes the same three things.

First is education. Instead of first time inventors having to recreate the wheel just to know where to begin, we have to make it easier to access and understand. We also need outreach to underrepresented communities early and consistently. Second, we must make it more accessible in terms of access to resources. The Leahy-Smith American Invents Act added four satellite PTO offices, a good start, but more would be better. Another idea is to revisit the USPTO's Patent Pro Bono Program, potentially to amend it to have it apply to underrepresented groups with a traditionally low rate of patenting. Third is representation. Highlighting inventors from diverse backgrounds helps create a new normal. It is always easier to do something when you see someone like you doing it already. This includes having a USPTO director from an underrepresented background.

Finally, there is one fundamental piece that underlies this all, and it is something that the tech industry has been doing for years. That is data. We cannot measure progress if we do not track our data and results. The PTO is not permitted to track even the most basic demographic information such as age or gender. Senator Hirono's IDEA Act goes a long way toward ensuring this fundamental piece. Thank you for your time.

[The prepared statement of Ms. Yen appears as a submission for the record.]

Chair LEAHY. Thank you very much and I appreciate and you actually addressed a number of the areas I am going to have questions on later.

We have Professor Lateef Mtima. He is a professor of law at Howard University School of Law. He is the founder and director of the Institute for Intellectual Property and Social Justice which advocates for the recognition of fulfillment of social justice obligations and the application of intellectual property law and policy. He graduated with honors from Amherst College, received his law degree from Harvard Law School. A note for my colleagues, before the hearing the professor and I were looking at pictures of Vermont foliage and we were talking about the traveling through New England, something he knows very, very well. Thank you for being here this morning, Professor, and please go ahead.

**STATEMENT OF LATEEF MTIMA, PROFESSOR OF LAW,
HOWARD UNIVERSITY SCHOOL OF LAW, WASHINGTON, DC**

Professor MTIMA. Thank you, Chairman Leahy, Ranking Member Tillis, and members of the Intellectual Property Subcommittee for holding this important hearing on improving access and inclusivity in the patent system. My name is Lateef Mtima, and I am a professor of law at the Howard University School of Law and the Director of the Institute for Intellectual Property and Social Justice. I appreciate your invitation to testify today in connection with this subject that is critical to the national interest.

In the spring of 1970 in New York City, I watched the Times Square newsreel for developments on the effort to rescue the crew of Apollo 13. As for all other Americans and indeed much of the world, the dilemma brought a new dimension to the time-honored supplication to bring the boys home. While we did not know the specifics, it seemed obvious that NASA spared nothing in the effort. Every possible idea from every possible quarter was being explored. Then, as recent events remind us now, we understood that when America makes use of her greatest natural resource, her reservoir, the most diverse pool of human innovative and creative capability on the planet, there is no challenge we cannot meet, no achievement we cannot obtain.

Unfortunately, such has not always been the case for our patent system or our IP ecosystem as a whole. Too much of America's intellectual potential from Marion, Virginia to Greencastle, Indiana to Compton, California is too often undeveloped and untapped. To paraphrase blues great Robert Cray, like food left out all night it is talent gone to waste. Systemic inequities relating to race, gender, socioeconomic class, and even geographic situs as well as structural imperfections in the IP system buttressed by a philosophical indifference toward the social justice obligations and opportunities of IP protection have at times stunted the social efficacy of our IP system.

That is why today I would like to applaud this present initiative of the Judiciary Subcommittee to improve access and inclusivity in the patent system and thereby unleash America's economic engine, as I believe it implements a social justice perspective toward our intellectual property ecosystem, one which recognizes the benefits of universal access, inclusion, and entrepreneurial empowerment and self-uplift. In the spirit of which I would respectfully offer three supportive proposals, which are set forth in greater detail in my written testimony.

First, the development of a national grassroots community IP education program through which government IP public outreach personnel can collaborate with private sector IP experts who have relationships with IP underserved communities to conduct basic IP awareness and information seminars in local venues of social, civic, and communal congregation.

Second, the development of a pre-prosecution patentability assessment pilot initiative in the U.S. Patent Office through which low-income inventors can obtain minimal or even no-fee preliminary confirmations of patent viability so that these inventors and potential investors can identify promising applications which warrant the expense of patent prosecution while avoiding the expendi-

ture of limited resources in connection with applications unlikely to prove successful.

Finally, the commission of a study as to how intellectual property concepts might be appropriately introduced into K through 12 and undergraduate arts and sciences education which is typically devoid of any reference as to the relationship of intellectual property to these academic studies and pursuits.

With that, I would like to close my statement with the observation that America can no longer afford fallow tracks of human potential. Systemic impediments to broad participation in IP enterprise sap the vitality of America's IP ecosystem and deprive our Nation of enrichments to our technological development, cultural advancement, and economic welfare. Contribution to the national storehouse of intellectual property achievement is both the privilege and the responsibility of every American and promoting the widest possible participation in this enterprise can only serve our national interest. Thank you and I look forward to answering any questions that you may have.

[The prepared statement of Professor Mtima appears as a submission for the record.]

Chair LEAHY. Thank you very much, Professor, and of course your full statement will be placed in the record.

Senator Tillis said earlier we have been working a lot on this. He has introduced staff which will be helping us. I want to note that I am joined here by Scott Wilson who is my senior IP policy advisor and no stranger to this Committee. The PTO has allowed us to have Molly Silfen as a counsel detailee. She knows the law far better than I do, and so that is going to be very helpful. Someday everybody will be able to see them without their—without their masks.

Professor, I note that we used to have a member of this Committee who has her academic ties with Howard, but she got tired of the Committee and moved to a different job in government as Vice-President of the United States, so otherwise she would be here to hear your testimony.

I want to ask—I want to ask Georgia Grace Edwards a question. She is hearing this. She mentioned in her testimony that securing a patent signals legitimacy in the market. Let me go into specifics on that if I might, Ms. Edwards. What are some examples of what that legitimacy brought to SheFly?

Ms. EDWARDS. Thank you for your question. I think there are several examples of how a patent helps boost legitimacy for an entrepreneur. One is the ability to legitimize and add additional revenue streams through licensing down the line. Companies are more likely to want to collaborate if a patent is in place. There is also the fact that without a patent other brands would have been much more likely to copy us from the start and we would have been left defenseless. As a small business, it is assumed that we would lose out against larger, more established companies. Patents are a way to protect small businesses and startups as they enter the market.

I also think that in terms of legitimacy, patents signal that you have an idea that is unique and useful and novel. That seal of approval boosts both customer and investor confidence in your product. That goes a long way in boosting inventor confidence as well.

The entrepreneurship world is pretty nebulous and so having something concrete like a patent goes a long way in fostering future success.

Chair LEAHY. Would it be safe to say that that legitimacy, especially if you are a minority or underrepresented community, that is just one more thing that you really want to have in showing who you are?

Ms. EDWARDS. Absolutely. Yes. In underrepresented groups, I think this is—these are groups where imposter syndrome runs rampant because there is a history of being excluded and being left out. When people from these groups finally do have a seat at the table, it is very easy to question it. I think a patent, again, goes a long way as this universal symbol of recognition that you have made it and you are on to something.

Chair LEAHY. I was impressed in reading your background that you had taken a class at Middlebury on entrepreneurship. If you had not done that, do you think you would have been starting a company and getting intellectual property rights in your invention?

Ms. EDWARDS. Absolutely not. I grew up in the Appalachian Mountains of Western Maryland, never learned anything about patenting or the IP process. Without the space and time that I was able to take at Middlebury College through both midcore and the Middlebury entrepreneurs class, that is where I was really able to learn about the process and that this was a possibility for my idea. I do not think I would be here today without it.

Chair LEAHY. I think we have to make sure that others get that same message out. One of the things we did in the Leahy-Smith America Invents Act was to create a Patent Pro Bono Program through the PTO to allow inventors with limited funding to get legal counsel for free. In your material voucher, it said that 50 percent of your revenue went toward legal fees which must have been a tremendous obstacle. Two questions. One, were you aware of the PTO pro bono program? If you had not had to spend all this money on legal fees, would you have been able to spend that money in your company?

Ms. EDWARDS. No. I was not aware of the patent—PTO's Patent Pro Bono Program. I certainly wish I had been aware of that at the time. I think to your second question about what I would have spent the money on with our business, I think a better question is what wouldn't I have spent the money on. I think paying ourselves and our team fair salaries for the work that we put in, being able to produce larger production runs from the start with upfront capital would have been helpful in reaching more customers. I also think R&D could have used a lot of that money. Right now we are in a position where we can only really design one product at a time due to cashflow constraints. Having more capital that was not going toward legal fees would have been really helpful for that R&D process.

Chair LEAHY. We have got to get that word out more and I would ask both Professor Mtima and Ms. Yen. We have—under the Leahy-Smith bill we created four PTO satellite offices around the country. I believe Detroit, San Jose, Dallas, and Denver. Satellite offices have conducted nearly 300 different training events, 23,000

people being involved. Can we do more through PTO to reach and assist underrepresented communities?

Professor, you are sitting right here. I am going to ask you first and then I am going to ask the same question of Ms. Yen.

Professor MTIMA. Yes. Thank you, Senator. I think the answer to the question is certainly yes. First of all, I think the very idea of the satellite offices was just an excellent innovation in of as itself. It conveys to inventors throughout our Nation that they are the priority, that they do not necessarily have to come to us in DC, but we recognize the importance of coming to them. It also conveys that we recognize that innovation is everywhere and it is not just simply in certain pockets of our Nation.

What we could do more in that regard, is that for one thing, I think we could benefit from additional satellite offices in particular regions of the United States. For example, I think the southeast region of the United States would be one, a good place. Some of the cohorts that we intend to target through these additional initiatives are well represented in that region. There are many highly professional, well-educated African American communities in that part of the country and those are some of the demographics that we are very interested in targeting.

The Northern New England region of the United States is another such area. I spent some time teaching at the University of Maine. One of the things that really impressed me in Portland was how the local economy was working so hard to adapt itself to various—to the loss of various diminishing industries. There was a great emphasis on really what—I am reminded of what Booker T. Washington suggested of the effort to just drop your buckets down right where you are, where the people are, and to tap into the innovative talent that was lying dormant in the area.

I think that the additional work that could be done in terms of additional offices as well as what was mentioned earlier encouraging those offices as well as the office here in the PTO to do more outreach, to actually send people out into the target communities as opposed to waiting or expecting them to come in and to send them out in collaboration with IP experts who already have ties to those communities.

Chair LEAHY. Thank you. I want to hear an answer also from Ms. Yen. I will note that I have gone way over my time, but obviously Senator Tillis will have as much time as he wants too. Ms. Yen, what would you say to that about whether we need more satellite offices?

Ms. YEN. Yes. Professor Mtima said it well. I do not have that much more to add except I agree, which is that grassroots and bringing—bringing the patent office to the individuals around the country goes a long way because grassroots helps. Also partnering with local organizations is a way of ensuring people feel like it is accessible and something that they can travel to because it is very challenging to navigate, as Ms. Edwards noted.

I agree that the Southeast, the South, as well as the Midwest, potentially the Pacific Northwest, as well as the Northeast. What I would do is look at where the tech industry has gone. Of course, not all patenting is in the tech industry, but if you can look to see where the tech hubs are, areas like Atlanta, South Florida, Lou-

isiana, et cetera. I think that will help inform what might be a successful satellite office.

Chair LEAHY. You also heard when Ms. Edwards said she was not aware of the pro bono program. That would have helped a lot. Do you think we should get the word out a lot more?

Ms. YEN. Yes. Absolutely. The Patent Pro Bono Program is potentially a great program, but I also think beyond just getting the word out, it is also taking a look at the requirements to see because it is primarily directed, as Ms. Grayson said, at financial. Do we want to amend it to account for underrepresented groups who traditionally have a low rate of patenting?

There are some requirements too that when you actually read it sound a bit daunting, but actually when I clicked through it and actually took the course yesterday, made it almost all the way through, it is actually not as daunting as it sounds like because, for instance, one of the requirements says there is a knowledge requirement. One of the knowledge requirements says, "Okay, you either have to prepare a provisional patent application". Oh, my gosh. Hugely daunting. "Or create—complete the certification course," which also sounds very daunting. Like how do I have time to do that on top of everything else? When you actually click through the link it is actually just a free training course and yes, you have to answer questions, but it was not that much harder than like a traffic school DMV exam.

Chair LEAHY. Thank you. Senator Tillis, please go ahead, sir.

Senator TILLIS. Thank you, Mr. Chairman. Thanks to all the witnesses for their opening testimony.

I would like to start with more of a baselining question. Do any of you—I have asked my staff to look into this, but do any of you have any insights into how the U.S. patent system stacks up against say European, UK, Canadian, other free market economy patent systems to know if there is a significant disparity with where we are? Do they all have work to do? Are there best practices that we can learn from them? Anyone have any access to that information?

Ms. GRAYSON. Thank you for the question, Senator. I did not look at that data in a ton of detail before in preparation for this hearing, but my recollection is that when it comes to women patenting, the United States does trail behind a number of countries. I do think that we have work to do. There are countries that are further ahead with regard to this than we are.

Senator TILLIS. Thank you. I just think it may give us an opportunity to build on some best practices if there are clear linkage between systemic approaches and better outcomes. When we have 13 percent of women listed as inventors and 50 percent African Americans, Hispanics, we know we have a long way to go.

Professor, I believe your organization expressed concern about the appearance of bias in the USPTO and if the USPTO were to collect demographics on patent filers as proposed under the IDEA Act. Could you give me—expand a little bit more on the apparent bias? I think you were talking about a nonprofit that would track this information that may be helpful. Can you expand on that?

Professor MTIMA. Yes. I think the appearance of bias can come about in two relevant ways. First of all, there are some commu-

nities that are just fearful of what government will do with the information. Some individuals believe that the fact that the patent office is not aware of my racial identity, not aware of my ethnicity, actually works in my favor. Although that may be completely groundless, the fact of the matter is that if that is a barrier to people providing us with the information, one way to get around that, if there is an independent nonprofit entity, the kind of entity that people in local communities usually open up to, that could be especially helpful.

Along those same lines, this is something that is of concern not only to people of various racial and ethnic backgrounds, but it is also a regional concern as well. I recall one of President Reagan's most famous lines that in certain parts of the country the words "We are from the government and we are here to help" does not actually make people feel comfortable. There are some people who perceive government as just they are here and when the leave I am going to be worse off. Again, if the people coming and reaching out to them and asking them for information are people they are more comfortable with, people who have a certain amount of social credibility, that was really what we were trying to get at.

Senator TILLIS. Incidentally, I like the idea that we need a satellite office in the Southeast and in New England. It is purely coincidental that that happens to be areas that both I and the Chair live, but I do think you have to be out there. The one thing that I have found with recruiting, diversity recruiting, you have to show up. I think that that is something that we should take under consideration.

What other datapoints do you think related to the innovation ecosystem would be helpful for researchers? What other information should we collect and maybe what other agencies and organizations should be engaged in that process?

Professor MTIMA. I think another datapoint is applications begun by individuals in the targeted groups, but not brought to fruition, meaning abandoned by them. Oftentimes what can happen is we presume the obvious that sometimes they just run out of money. I think there is also this discomfort and suspicion about the process. You have individuals who they have obtained their skills oftentimes outside of the accredited channels. A lot of people are self-taught or some people earned their degrees working at night while working full time. For them, when people in positions of authority seem to be questioning their credibility and their expertise, that is just part of the normal patent prosecution process, right. That is what we are supposed to do to narrow down the invention. It may appear to some of these individuals that this is just another artificial barrier that someone is placing in front of me. Getting some understanding as to how many people abandon the process on their end and why that happens and to the extent that maybe some of these issues are a factor.

Senator TILLIS. Thank you. I think that is a great point. Even the training that Ms. Yen talked about, to us it seems simple. You just click on it and see that it is a simple questionnaire, but anytime an individual is dealing with big government, it is a daunting task. You see that in a regulatory context.

I will be submitting some other questions for you for the record about possible other data we should collect, specifically around trademarks, whether or not we should have the same application for trademarks and other questions. I think all the witnesses, and Ms. Edwards, I have been on the website. I am an outdoors person and I try to get my wife and my granddaughters outdoors. I am going to make sure they are aware of your product. It is very innovative. Thank you for joining. Thanks to all the witnesses. Thank you, Mr. Chair.

Chair LEAHY. Thank you. We are going to be joined now by Senator Hirono virtually. There you are. Aloha.

Senator HIRONO. This is for the panel. Women and minorities who have not traditionally engaged with the patenting process may be turned off by its complexity and expense and as Ms. Edwards says, it is clunky. As she said, that is putting it nicely. Some of the resources made available by the patent office have been mentioned by some of you. For example, the pro se assistance program, a pro bono program, and a law school clinic certification program. These are all efforts by the patent office to help entrepreneurs access the patent process.

For all of you, do you consider these programs effective? Do people know about them? What are some very specific ways that we can make these programs better serve the public that they are intended to serve? For example, Ms. Yen talked about the pro bono program and maybe we should look at who they are really helping. Do any of you know? Are these effective? Any improvements?

Ms. GRAYSON. Senator, I would love to take a stab at that. I think the programs, when people find them, are effective. The U.S. Patent and Trademark Office, you know, I am—my personal practice means that I am on a number of email data bases or email listservs from a number of agencies. I think that the U.S. Patent and Trademark Office really does a good job with the amount of information that they push out. The question really is, Is the information landing on the right people? Because there are tons of videos and the office actually does some sort of educational online programming just about every week.

I think the challenge is finding the right audience. I really love the professor's idea about meeting kind of underrepresented people where they are. Some sort of an initiative that involves the U.S. Patent and Trademark Office working with people in those communities or the people in the private bar or entrepreneurial support organization in those areas I think could potentially go a long way to having that programming actually land on the right people.

Senator HIRONO. Uh-huh. I know for a fact that the PTO office has sent people from their office to places such as there was a program in Hawaii and there were a lot of people who showed up to ask questions and find out how they could access the patent process. Any of the rest of you have any other good ideas on how we can land these programs on the people that need them.

Professor MTIMA. Yes, Senator. I would—First off, I would echo what Ms. Grayson's comments that these are fantastic programs. I just looked at the Innovation Hub again the other day and I was just reminded as how just a wonderful teaching tool that this could be. I think that again the issue is going out into the communities.

We have a program at the nonprofit I work with in which we actually go into local communities and we find these places in which people are naturally interested in going, community centers, sometimes just local eateries, nighttime spots. I have characterized the experience that we have put together as almost an indoor block party. It has a kind of festival feeling to it and we give people lots of hard core information. People ask lots of questions.

I think the key is that, you know, nobody likes to go to the dentist. It does not make it even better if the dentist office to make a house call. What you have to do is in addition to not only bringing the information into the community, you have to structure it in such a way that people who already feel intimidated, who already are fearful that their questions are going to appear dumb and they are going to seem limited, you have to make it as welcoming and as oriented to them as possible.

That is why I think that working together with IP professionals who already have ties to these communities like all of my fellow panelists, working in collaboration with the USPTO office would be an excellent way to move the information and reach the people that we would like to reach.

Senator HIRONO. That is an excellent idea. Are there other places that have incorporated your kind of outreach program, Professor?

Professor MTIMA. Honestly, I have to say no. I think that there are other entities and organizations that are very much interested in this type of work and achieving those types of results. The thing of it is, is that the usual methodology is to put together a team of individuals to speak. Oftentimes it is, of course, including a diverse assemblage, but it is usually either: (a) to ask people to come to them; or (b) when the team is exported into a community, the structure, the framework, the presentation, it is just—people feel as if you just lifted an office from downtown and then just transported it into the community.

Senator HIRONO. I think that is also a really good observation. This may be some of the kinds of things that you do, Ms. Yen, with your Operator Collective. Yes, I know that minorities and women have a much harder time accessing VC. By the way, it is really good to see you, Ms. Yen, and please give my greetings to Michelle Lee. You are cofounders of the ChIPs. I was honored to be placed in your ChIPs Hall of Fame back in 2018 following people like Michelle and Ruth Bader Ginsberg, so thank you for all that you are doing.

What is the Operator Collective doing to really address some of these access issues, particularly to financial support?

Ms. YEN. Yes. Senator Hirono, thank you for your long time support of ChIPs and all that you have done for the intellectual property community as well as the Asian American community. Thank you for your leadership. It is good to see you as well.

A lot of these things are what we did to try to make venture accessible to women operators. Same thing, right? We are quietly in the background building. People do not know who we are. We look up and we see white males, right. We do not see people who look like us, as Ms. Edwards said. It becomes very hard to do so. You have to shift the narrative. You have to change the system. Instead of making your—you know as the professor said, instead of saying,

"Hey, we need to now conform to this rigid construct," let us bring it to terms that make it more comfortable.

That is from like education. How do you make it so that if someone is busy, has 150 percent to their day job, how do you make it easy for them to digest? How do you make it fun? How do you make it enjoyable which is like—you know, I am generalizing here, but women are social. We like to be together, and we also do not like to sign up for things if we think we cannot carry through with them. We did things by saying, "Hey, it is okay. You can do this because we have got redundancy."

Just along those lines, which is thinking about instead of making the inventors or the would-be inventors conform to the rigid system, let us think about ways to make them comfortable, whether it is in the coffee shops. We have had our limited partner investor meeting not in a hotel, but we actually had it at my house, which is unusual.

Chair LEAHY. Very good. Thank you.

Senator HIRONO. Thank you. I know I am running out of time, but Mr. Chairman, if I may, it is really important to diversify the patent bar because women and minority inventors need to see people who look like them who share their experiences, so that is something that I am pursuing with PTO.

One last thing. I would like to ask unanimous consent to enter into the record a statement from Holly Fechner, who is the executive director of Invent Together, an initiative dedicated to understanding the gender, race, income, and other diversity gaps in invention and patenting supporting public policy and private efforts to close them. Mr. Chairman, I ask for unanimous consent to enter this material.

Chair LEAHY. Without objection it will be part of the record.

[The information appears as a submission for the record.]

Senator HIRONO. Thank you.

Chair LEAHY. Again, as I said earlier, I applaud you for your work in bringing diversity in an area where—I know the professor agrees. I see him nodding his head. We should all be agreeing. I thank also Senator Tillis for his work in that.

We have been joined by Senator Blackburn. Senator, I yield to you.

Senator BLACKBURN. Thank you, Mr. Chairman, and I am absolutely so delighted that we are having this hearing today. I thank you for this and for bringing such a great panel of witnesses before us. I have to tell you how timely this is. I recently had in the past week conversations with two women that I have met or two individuals I have mentored, each minorities. One of them—and, Professor, you will appreciate this. As they were telling me about what they were working on, I said, "Have you thought about getting a patent for this?" Their immediate response to me was, "Well, no, but how would I do that? Who would I go talk to?" We had a conversation about resources that are available. But you are so spot on when you say they do not know where to find the resources, so thank you for getting that entered in on the record.

Another, the other conversation had to do with how to find people that could have them navigate that process of having created something, but moving it through that development process and

then moving it to commercialization. I had directed this individual to where they could probably find some of those resources, but there again, the challenge is not knowing how to navigate this system. Senator Tillis talked about looking at best practices from other countries.

One of the concepts I have always had an interest in is when you look at the microfunding for individuals that are trying to start businesses and I think that is why I have enjoyed mentoring women as they would be beginning to go through this process.

Ms. Edwards, I want to come to you first. Let us see if you can articulate and if you can answer this or if you want to submit it for the record after giving it thought. Just let me know. What are some of those specific difficulties that you have encountered or women that have come to you to ask for advice, that they are encountering? Then likewise, were you able to find a female mentor or a male mentor, someone that could help you navigate that process? If you will just briefly touch on that.

Ms. EDWARDS. Sure. I am happy to submit further thoughts following. I think that the biggest issue was not knowing who exactly to approach. I am speaking for myself, but I think that I would be more than happy to appear before other people who are thinking about patents and talk about my experience and the rationale behind it and how I approached it. I wonder about the possibility of creating some kind of group of women and other people from underrepresented groups to speak to those specific issues that come up for minority inventors.

To your second question, our legal counsel is all male and they have been very helpful, but no. I did not have a female mentor in the legal realm specifically.

Senator BLACKBURN. Okay. That is something I am sure you—there were nights when you were working on your product that you wish you had had that insight.

Ms. Yen, I would love to come to you because many times as I am working with women, they will say, “I do not have access to capital.” They go to the local bank and the bank says, “Well, I am not sure I understand exactly what the market would be for this product.” Speak specifically as to what VC firms or maybe angel investors, that type group could do to move forward information to women about and to women and minorities as to how they can access capital, what the proper process is for gaining that access to capital, whether it is through a VC or an angel investor or whether it is through a traditional banking relationship?

Ms. YEN. Yes. Thank you for the question. It is something that the venture world actually has been working on vigorously probably for the past few years with actually some great success, which is directed reach out to female founders. Ms. Edwards, I do not know if you have seen this as well, right, which is there are—what we started with with the venture world was actually diversifying the representation for the people who had the money, which is VCs like me, people who have the funds. There is a trickledown effect because it is very, very hard when no one anywhere in the process looks like you and they cannot relate necessarily to what you are trying to pitch, how you are trying to pitch it. We all have our unconscious biases that we are always going to have.

Since a lot of it is education and a lot of it is reach out, which is directed reach out to women, people of color, and those who really just need to see people like them who are in these positions. It is—we have done it with a lot of success in the venture world with, for instance, a nonprofit called All Rise, which was started by some friends of mine with great success. I think also partnering with nonprofits, partnering with private individuals in addition to having the USPTO as part of it would go a long way.

Senator BLACKBURN. I appreciate that. You know, in Tennessee, we have a long history of female entrepreneurs. We have Barbara Askins who was a scientist and a chemist from Belfast. She came up with a way to enhance photo negatives by using radiology. NASA ended up using this and then the medical field picked it up to make better x rays. Of course, even today we have the most incredible creative community in Tennessee with songwriters, with entertainers, with those that are creating next generation automobile engines that are working with GM and Nissan and Volkswagen and continuing to open these doors for innovators so that they can dream those big dreams I think is paramount.

I thank you all. Thanks for the hearing. Yield back.

Chair LEAHY. Thank you. I understand Senator Padilla is tied up at a hearing and will not be joining us. I did not know whether Senator Tillis had other comments you wanted to make.

Senator TILLIS. Maybe just a comment. As I think about this, we have done a lot of work. In our Senate Armed Services Committee hearing we talk about China and its emergence as an economic and military superpower and I have heard reports of the number of patents that they are filing today are just at an exponential pace. Beyond doing the right thing, which is making the patent system more inclusive, there is a compelling national security and economic security imperative to drive more innovation.

We are not talking about just changing the mix on the current churn rate of patents. We are talking about greatly adding to it. Professor, I think you mentioned the contribution or one of the witnesses mentioned the contribution of the African American women in the Apollo mission, an extraordinary story that had its hurdles in the beginning. When they were included, they are one of the reasons why we had astronauts return safely home, including Senator Glenn.

We need to look at this from the standpoint of doing the right thing, but we are doing the right thing not only for the moral reasons, but for the compelling economic and national security reasons and the benefits that we would derive from it. I, for one, appreciate the Chair having this hearing. I particularly appreciate the work that we do after the hearing to move forward on measures that make sense.

Mr. Chairman, I would like to enter into the record an April 16, 2021 letter from the Intellectual Property Owners Association representing a broad range of intellectual property owners that express support for the Subcommittee's efforts to address the gender gap and the racial gap among patent practitioners. I also want to include a summary of the IPOs and the IPO Educational Foundation's joint efforts to increase diversity and innovation in the ecosystem without objection.

Chair LEAHY. Without objection.

[The information appears as a submission for the record.]

Chair LEAHY. Ultimately, we will keep the record open for a week for further comments and so the post-statements of all the witnesses will be included. Thank you for mentioning my late friend, Senator Glenn. He and I were elected the same year and he talked about what then turned out in the movie, Hidden Figures, and the women who had those numbers. I will not go into it here. I will mention privately what he said to NASA when they said they could not wait for the—they did not have time for them to get all the figures. Senator Glenn pointed out who was going to be in that capsule and he sure as heck was going to wait because he wanted their figures. The movie itself is a stirring, wonderful movie.

With that, we will stand in recess. Thank you.

Senator TILLIS. Thank you.

[Whereupon, at 11:28 a.m., the Committee was adjourned.]

[Additional material submitted for the record follows.]

Witness List
Hearing before the
Senate Committee on the Judiciary
Subcommittee on Intellectual Property

"Improving Access and Inclusivity in the Patent System: Unleashing America's Economic Engine"

Wednesday, April 21, 2021
Dirksen Senate Office Building Room 226
10:00 a.m.

Georgia Grace Edwards
Co-Founder
SheFly
Burlington, VT

Mallun Yen
Founder and Partner
Operator Collective
Woodside, CA

Angela Grayson
Founder and Principal Member
Precipice IP PLLC
American Intellectual Property Law Association
Bentonville, AR

Lateef Mtima
Professor of Law
Howard University School of Law
Washington, D.C.

Georgia Grace Edwards

U.S. Senate Judiciary Committee Testimony: Subcommittee on Intellectual Property
Improving Access and Inclusivity in the Patent System:
Unleashing America's Economic Engine
April 21, 2021

Good morning! I would like to start by thanking Senator Leahy and his staff for their work to improve access and inclusivity in the U.S. patenting process. This push for greater diversity and outreach efforts in American intellectual property is an initiative with the potential for tangible effects, not just on my small business or others like mine in the state of Vermont, but on individuals and businesses across our nation. I am only twenty-five years old, but I have a feeling that this opportunity to share my experience as an American entrepreneur and inventor will be among the greatest honors of my life, and I am grateful to you all for having me.

SheFly® is a layerable line of outdoor pants for women that allows us to safely, comfortably, and easily answer nature's call—quite literally speaking—without exposing skin to the elements or other people. Our patented technology features a zipper and accompanying flap, which begin at the base of the zipper we're accustomed to using to get our pants on and off and extend all the way to the back of the pant, so that the user can control the size and location of the space they need to create in order to relieve themselves. Through this design, we are able to help the 1 in 3 women who have had a bathroom accident in the past year while adventuring outside—a statistic that has presumably only increased during the COVID-19 pandemic, as more Americans have taken to the outdoors and more public restrooms have closed.

As a Vermont small business owner, my ability to protect my ideas was crucial to my ability to scale and succeed. Patenting is extremely central to our business model. In our country's vibrant and highly competitive start-up ecosystem, patents make or break an entrepreneur's ability to signal legitimacy in a market, gain new customers, establish additional revenue streams through licensing, and achieve a favorable valuation with investors. More importantly, our patents are what will allow us to bring our technology to people in all different sectors—not only rock climbers, hikers, backpackers, mountaineers, and guides, but also field scientists, ski patrollers, farmers, carpenters, bridge inspectors, engineers, international aid workers, park rangers, people who use wheelchairs, police, and women on the front lines of our military. Women risking their lives to protect American citizens have more important things to worry about than when and where they can next relieve themselves. They deserve the top technology our society has to offer, and adult diapers, as we say where I'm from, "ain't it." As former U.S. army captain and current Director of Innovation and Entrepreneurship at the U.S. Department of Commerce Emily Miller says, "Pants that don't work for women are a safety issue. I have far too many stories of having to stop my all-male platoon of soldiers to go pee by myself on a dangerous highway in Iraq or [risk] dehydrating myself so severely I'd be sick. I ended up breaking my leg fast-roping out of a helicopter in Afghanistan in part because I was wearing clunky men's gear. We deserve gear designed with

women in mind.” We wouldn’t be able to deliver on that gear if it weren’t for our ability to patent. And because I’m aware that this subcommittee is three-fourths male, you might be interested to hear that yes—we average several emails a month from men interested in utilizing our technology for their needs, too. Patents increase the reach of good ideas and the number of people in our society who can benefit from them.

How is it that America has been able to put a man on the moon (and spacecraft on Mars), but is somehow still stumped about how to help female soldiers go on the go? Well, intellectual property rights do not come easily, especially for traditionally underrepresented groups. We are a company whose existence can be attributed to the work of trail-blazing women who paved the way before us, and we see this hearing as an opportunity to do the same for the young, female, and rural innovators who are similarly creating inclusive design. My hope is that by sharing SheFly’s experience, we can work together to make the patenting path a bit smoother for those who will walk it next, especially for those who do not currently see themselves reflected in the process.

In navigating the trademarking and patenting process, SheFly® faced three specific, inter-related barriers: 1) the representation barrier, 2) the knowledge barrier, and 3), the financial barrier. These obstacles operate in a positive feedback loop, further entrenching detrimental cycles that prevent the U.S. from effectively taking full advantage of the brilliant ideas that everyday Americans have to offer.

For an entrepreneur, the initial steps in building a company involve talking to people—cold calling, black-hole emailing, putting out feelers—making connections with those who have been through it before and can advise on helpful contacts and tips. I imagine it’s not too different from your experience in politics. In the Middlebury Entrepreneurs class where I built out SheFly®, I spent an entire month doing just that, and was unable to find a single person with my background who had been through the intellectual property process in my industry. In fact, I didn’t talk about patenting to anyone who *wasn’t* a wealthy, middle-aged white male in the field of engineering or tech. While those connections provided some advice, it wasn’t always advice that was relevant or useful to me, as a 22-year-old female college student working 2 jobs and trying to break into the outdoor apparel industry from a rural town in the Green Mountains. The power of representation is greatly underestimated. When you don’t see anyone who looks like you doing something you want to do, it makes you question whether it’s even possible in the first place. Starting your own business is hard enough. Starting a business in a field where you don’t know anyone and haven’t seen anyone who looks like you obtain intellectual property before is an utter shot in the dark. If it weren’t for the realization that “If not me, who?”, I would have foregone the process on these grounds alone.

The lack of representation in turn leads to a lack of insider knowledge. Patenting in the U.S. is extremely intimidating: long, clunky, opaque, and bureaucratic—and that’s my kindly worded, highly edited description of the process. IP law is a very niche body of knowledge, it’s hard to teach yourself, no matter how many honors you graduate with. As senators, you

have some of the best researchers in the country on your staff, but set them loose on a patenting process goose chase, and I suspect they will end up with more questions than answers. In fact, there have been several instances where I'm in the trenches alongside our very bright and reputable Burlington-based lawyers, teaching them the differences between certain claims, re-drafting relevant language, and helping to perform patent searches. The lack of access to a centralized resource with clear information on the trademarking and patenting process that is specific enough to help gauge particular needs and likelihoods of individual intellectual property is why most sources recommend hiring patent attorneys, which brings me to the next barrier.

If you think you've spent a lot on the coronavirus relief bill relative to your overall budget, you should see how much SheFly® has spent on legal fees over the course of the past two and a half years. There have been points in time where SheFly® has spent well over 50% of our revenue on legal fees to cover the immense amount of labor, time, and costs associated with filing. From a basic economic standpoint, the long-term, up-front investment in intellectual property is one that is often directly at odds with the short-term realities of start-ups and small businesses. When faced with the difficult decision of purchasing needed fabric for a production run, paying a local seamstress for her help iterating on prototypes, or deciding to file another type of patent or a patent in an additional jurisdiction, the choice to push for patents almost always falls to the end of the list of priorities, despite its potential to create the largest future revenue streams. SheFly® has seen a lot of success, but even as recently as last week, we have had to forego patenting opportunities for lack of the necessary capital. Due to the high cost and low probability of reward through patent approval, entrepreneurs are not incentivized to pursue intellectual property in our current economy.

The less you see people like you obtaining intellectual property, the less likely you are to have all the information necessary to make informed decisions. With limited access to said information, the more likely you are to need to hire legal counsel, which results in less capital available for important start-up steps needed to accelerate. The less cash flow you have, the less likely you are to succeed and to obtain patents, resulting in fewer people who come to own intellectual property. This is the extremely challenging cycle of interconnected barriers that have kept women, people of color, young people, and people living in rural areas with lower socioeconomic statuses from fully participating in U.S. entrepreneurship. By perpetuating these cycles, we're missing out on a plethora of ideas that could contribute to the well-being of American citizens and our standing on the world economic stage.

In closing, I'd like to emphasize that any proposed legislation that fails to recognize and address the representation, knowledge, and financial barriers to entrepreneurs and small business owners will be incomplete. I appreciate the opportunity to share SheFly's story on this virtual Senate floor and I look forward to seeing how the Senate works to improve access and inclusivity in the patent system. I envision a world where one day, women and girls don't have to think twice about answering nature's call—or about their ability to participate in the U.S. economy as inventors, entrepreneurs, and business owners. I and so many others are counting on you to change the traditional narrative of entrepreneurship in America.

Thank you.

AIPLA

Testimony of

Angela J. Grayson, CIPP/US, CLP
Chair, Diversity in IP Law Committee
American Intellectual Property Law Association

Before the
U.S. Senate Committee on the Judiciary
Subcommittee on Intellectual Property

Hearing on

“Improving Access and Inclusivity in the Patent System:
Unleashing America’s Economic Engine”

April 20, 2021

I. Introduction

Chairman Leahy, Ranking Member Tillis, and distinguished members of the Intellectual Property Subcommittee, I appreciate the opportunity to present the views of the American Intellectual Property Law Association (AIPLA) on “Improving Access and Inclusivity in the Patent System: Unleashing America’s Economic Engine”. We are grateful for the time, resources and leadership you and your staff have devoted in recognizing the importance of this issue to the future of our nation’s innovation system, and for your continued attention to the challenges that need to be addressed and overcome if we are to continue to thrive as a nation of innovators.

My name is Angela Grayson. I am a technology lawyer. I am the rare woman of color who is also a registered patent attorney. I have been in the field of patent law for two decades, having started my career as a patent examiner at the United States Patent and Trademark Office (USPTO). I practiced law for almost 15 years as an intellectual property attorney for large multinational companies including Pfizer, Eli Lilly, DuPont, and Walmart. About 5 years ago, I transitioned from corporate America, in favor of small business ownership, and I presently own the technology law boutique PRECIPCE where I have the pleasure of supporting, encouraging, and empowering science and technology startups in the specialty chemical, pharma, software, and medical device fields. I have had the privilege of participating in nearly every aspect of our nation’s innovation ecosystem, and it is from this experienced, diverse perspective that I come before you today. I am here to represent the views of AIPLA, where I presently serve as Chair of the Diversity in IP Law Committee.

Founded in 1897, AIPLA is a national bar association with approximately 8,500 members engaged in private and corporate practice, in government service, and in the academic community. AIPLA's members represent a wide and diverse spectrum of individuals, companies, and institutions involved directly or indirectly in the practice of patent, trademark, copyright, and unfair competition law, as well as other fields of law affecting intellectual property. Our members represent both owners and users of intellectual property. AIPLA's mission is to promote an intellectual property system that stimulates and rewards invention, creativity, and investment while accommodating the public's interest in healthy competition, reasonable costs, and basic fairness.

II. The Problem: Challenges in Innovation

In recent years, objective indicators reveal the United States' standing in innovation¹ is changing. For the second consecutive year, China has outpaced the United States in patent filings. According to Daren Tang, World Intellectual Property Organization Director-General "It's not as if filings from the traditional parts of the world like the U.S. or Europe have decreased, it's just that the rate, the acceleration, has become a lot stronger in Asia." Our nation's leading agencies, namely the U.S. Department of Commerce and the United States Patent and Trademark Office have proposed a national strategy to counter this surge. In 2020, the USPTO announced the strategic need to develop new ways to expand American innovation, and to that end, the National Council

¹ See <https://www.caixinglobal.com/2021-03-03/china-beats-us-in-patent-filings-for-second-straight-year-101669845.html>, accessed April 2021. ("China has captured the top spot in 2020 among international patent applications for the second consecutive year, a United Nations ranking released Tuesday shows, demonstrating once again how Asia is leading the tech innovation in the new normal.")

for Expanding American Innovation (NCEAI) was born. The Council's role is to strategize new ways to expand American innovation by tapping into the strength of our nation's *diversity* and find ways to increase the opportunities for all Americans to participate in innovation. AIPLA is a member of the Council, represented by our Immediate Past President, Barbara Fiacco. I also participate as a member of one of the Council's Working Groups.

III. Ecosystem Barriers to Innovation

Data show that diverse teams achieve better results.² Yet, women, socially disadvantaged individuals, and economically disadvantaged individuals comprise a small fraction of innovators who apply for and obtain patents. This suggests that their innovative potential is underutilized or not acknowledged. The differences in the number of inventors in these underrepresented communities in the private and public sector have been reported in recent studies. For example, women are more likely to be listed as inventors on patents granted to public or not-for-profit organizations.³ Private firms account for the majority of patenting in the United States. However, the percentages of members of underrepresented communities are lower in private firms than in other inventor-organizations. Therefore, supporting and expanding participation by women and minorities in innovative activity specifically targeting private firms may help offer a solution to improve women and minority inventorship rates. Research from Opportunity Insights, a

² <https://hbr.org/2016/11/why-diverse-teams-are-smarter>

³ See Sugimoto, C.R., C. Ni, J.D. West, and V. Larivière, 2015. "The Academic Advantage: Gender Disparities in Patenting." PLOS ONE 10, e0128000. <https://doi.org/10.1371/journal.pone.0128000>; and Martínez, G.L., J. Raffo, and K. Saito, 2016. "Identifying the Gender of PCT inventors." WIPO Economic Research Working Papers No. 33. <http://www.wipo.int/publications/en/details.jsp?id=4125>.

Harvard University research team, confirms disparities in opportunity across gender, race, and income. The researchers found that women, in particular, may be considered “lost Einsteins”—people who would have contributed valuable inventions had they received early exposure to innovation and inventor role models.⁴ The research suggests that harnessing this underexploited talent could spur innovation and drive growth.⁵ Unfortunately, despite wide recognition that diverse teams drive additional business value, in practice many businesses fail to capitalize on their underutilized human assets to drive higher returns.⁶ Women and underrepresented communities present substantial underutilized value. Systematically engaging them in the innovation ecosystem will have a great positive impact for these individuals, their employers, and the American public as a whole.

In 2012, the National Bureau of Economic Research (NBER) published a paper entitled “Why Don’t Women Patent?”, which highlights a significant gender gap in patent inventorship, showing that women inventors comprised just over 10% of inventors (where at least one inventor is a woman) listed on U.S. origin patents issued in 1998.⁷ The paper additionally proposed that closing this gender gap among women Science and Engineering degree holders would

⁴ Bell, A.M., R. Chetty, X. Jaravel, N. Petkova, and J.V. Reenen, 2017. “Who Becomes an Inventor in America? The Importance of Exposure to Innovation”. National Bureau of Economic Research Working Paper No. 24062. <https://doi.org/10.3386/w24062>.

⁵ According to Bell et al. (2017), if women, minorities, and low-income children were to invent patented technology at the same rate as white men from high-income (top 20%) households, the rate of innovation in America would quadruple. See http://www.equality-of-opportunity.org/assets/documents/inventors_summary.pdf. (accessed March 1, 2018).

⁶ See, e.g., A. Vaccaro, “Why Diverse Teams Create Better Work,” *Inc.*, Mar. 25, 2014, available at <http://www.inc.com/adam-vaccaro/diversity-and-performance.html> (last accessed Nov. 23, 2016).

⁷ J. Hunt, et al., “Why Don’t Women Patent?” National Bureau of Economic Research (NBER) Working Paper No. 17888, March 2012 at 1, available at <http://www.nber.org/papers/w17888> (last accessed Nov. 23, 2016).

increase commercialized patents by 24% and GDP per capita by 2.7%.⁸ Patents with at least one woman inventor accounted for 18.8% of patents through 2010 and increased to 21.9% through the end of 2019, at the current rate, it will be 2072 and beyond before women are awarded as many STEM patents as men.^{9,10} The underrepresentation of women and minorities in patenting is a complex problem. Reports suggests the use patenting as a proxy for inventing and assumes that because women and minorities are not patenting, they are also not inventing. However, as the testimony from the “Lost Einstein” hearings in 2019 before the IP Subcommittees of both the US House of Representatives and Senate demonstrated, although there certainly could be better representation in STEM fields from women and minorities, they are present and are inventing. Women and minorities are engaging in innovation. However, many do not take the next step to patent. Even if they are interested in patenting, they may face other barriers.

In addressing our nation’s innovation shortfalls through the lever of diversity, it is imperative to do so in a *systemic* fashion. We believe that as a community, we need to actively **1) acknowledge** the creativity and ingenuity of diverse populations of innovators and entrepreneurial support organizations and providers (ESOs), **2) empathize** with the challenges faced by diverse populations and work to remove those barriers, and **3) activate** resources,

⁸ *Id.* at 2.

⁹ L. Santhanam, “Why are most inventors men?” *PBS NEWSHOUR*, Sept. 27, 2016, available at <http://www.pbs.org/newshour/updates/why-are-most-inventors-men/> (last accessed Nov. 23, 2016). To learn more about the progress and potential of women in patenting, see PatentsView (www.patentsview.org), a web-based data resource supported by the U.S. Patent and Trademark Office (USPTO) Office of the Chief Economist.

¹⁰ “Progress and Potential: 2020 Update on U.S. Women Inventor-patentees” *USPTO*, November 4, 2020 (<https://www.uspto.gov/sites/default/files/documents/OCE-DH-Progress-Potential-2020.pdf>) access April 2021.

both human and material, of which diverse populations may be unaware or may lack the confidence to use.

A. Acknowledge Creativity and Ingenuity That Diversity Brings

The saying goes, “Diversity is being invited to the party, but inclusion is being asked to dance.”¹¹ Before any strategy can be executed that incorporates diverse innovators from the perspective of race, gender, or ethnicity, it is important to acknowledge the value of the diverse individual. To someone who has grown up with their value being reinforced at every turn, this may seem an unnecessary step in the framework. However, speaking from personal experience as a woman of color, and having worked with women and people of color in both large and small enterprises, reminding individuals of their worth and value in our innovation ecosystem is time well-spent. Recognizing their diversity and the creative value their diversity provides can pay creative dividends in the future.

For example, at AIPLA, we fulfill much of our mission through organized committees. AIPLA has roughly 60 administrative and substantive committees which provide education to our members and formulate proposed positions for the Board of Directors to consider adopting on behalf of the Association. One of those committees is the Diversity in IP Law. As Chair of the Committee, our mission is to effectively serve AIPLA members from diverse backgrounds, to

¹¹ Vernā Myers is a Harvard-trained lawyer and founder of The Vernā Myers Company. Ms. Myers is also currently the VP, Inclusion Strategy at Netflix. Ms. Myers has done hundreds of hours of diversity and inclusion training, written numerous books on diversity and inclusion, and is widely regarded as a leading DE&I expert in the business and legal community. See <https://www.vernamyers.com/about-verna/>, accessed April 2021.

encourage the professional growth of our members, and to embrace and celebrate the diversity of our membership. We think it is important to celebrate and *acknowledge* our racial, gender, and ethnic differences, because these differences can catalyze creativity, and diversity of thought. Our Committee is not limited to diverse professionals. We think it is important to welcome everyone willing to embrace the value diversity can provide, and we strive to create a safe space in our Committee for our members to be both seen and heard, recognizing such a safe space may not exist in our members' professional workplaces. This year alone, our Committee has planned and provided programming to educate our membership around topics including, but not limited to, Diversity, Equity, and Inclusion. Our programming is not simply about *educating*, but also about *acknowledging* and *celebrating* our diversity, because we believe by doing so, we can catalyze and unleash our own creativity and value to the clients we serve.

B. Empathize with Creators to Uncover Hidden Potential

We as intellectual property professionals believe it is important that everyone participating and contributing to the innovation process is recognized and valued for that contribution. As an example, in-house professionals can employ empathy to identify women and people of color who may be hidden. In my personal experience, when you work closely with diverse project teams, it can be important to engage in a little due diligence to pressure test any inventorship determination that does reflect the project team as a whole. Frankly, looking at invention disclosures with a critical, yet *empathetic* eye, can work to uncover

hidden and Lost Einsteins.¹² It can have the effect of working to empower underrepresented individuals in the innovation ecosystem. The expressions “*representation matters*,” and “*if you can see it, you can be it*,” are examples of empathic approaches to innovation. Understanding the challenges faced by innovative women and people of color can help in assessing and elevating innovation through these individuals drive our nation’s economic engine.

We also believe it is beneficial to better understand the participants in the innovation process, which is why we support the “Inventor Diversity for Economic Advancement Act (“IDEA”) Act of 2021. The voluntary information collected by the USPTO may be evaluated and studied and could be useful in developing various ways to address where the system may not be sufficiently serving inventors in underrepresented communities.

¹² Lost Einsteins: Lack Of Diversity In Patent Inventorship And The Impact On America’s Innovation Economy, Wednesday, March 27, 2019 House of Representatives Subcommittee on Courts, Intellectual Property, and the Internet, Committee on the Judiciary (<https://www.govinfo.gov/content/pkg/CHRG-116hhrg36359/html/CHRG-116hhrg36359.htm>) accessed April 2021

C. Activate Innovators by Sharing Time, Talent and Resources

Invention and creation have been a priority of our nation since its founding. Article I Section 8, Clause 8 of the Constitution of the United States provides [The Congress shall have power] “to promote the progress of science and useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries.”¹³ However, the opportunities for all Americans to hold patents did not always exist.¹⁴ While our country’s laws have evolved, psychological barriers to participating in the innovation system may remain. The USPTO¹⁵, the legal community¹⁶, states, and other players in the innovation ecosystems have amassed many resources for innovators. However, simply because a resource exists does not mean the intended recipient will discover or use it.

When the Lost Einsteins hearings took place before this Subcommittee in 2019¹⁷, it was shocking to hear in some of the testimony that a number of women and inventors of color believed few resources, both legal and financial, could assist them in their quest to protect their intellectual property. We believe substantial resources do exist to assist inventors. For example, as will

¹³ <https://constitution.congress.gov/browse/article-1/section-8/clause-8/>

¹⁴ See The Colorblind Patent System and Black Inventors by Shontavia Jackson Johnson, Published in *Landslide* Vol. 11 No. 4, 2019 by the American Bar Association https://www.americanbar.org/groups/intellectual_property_law/publications/landslide/2018-19/march-april/colorblind-patent-system-black-inventors/, accessed April 2021

¹⁵ USPTO Patent Pro Bono Program for independent inventors and small businesses (<https://www.uspto.gov/patents/basics/using-legal-services/pro-bono/patent-pro-bono-program>) accessed April 2021

¹⁶ AIPLA Special Committee on Pro Bono (<https://www.aipla.org/committees/probono>) accessed April 2021

¹⁷ U.S. Senate Judiciary Committee, Subcommittee on Intellectual Property Trailblazers and Lost Einsteins: Women Inventors and the Future of American Innovation (<https://www.judiciary.senate.gov/meetings/trailblazers-and-lost-einsteins-women-inventors-and-the-future-of-american-innovation>) accessed April 2021

be discussed later in more detail, the USPTO has launched a Patent Pro Bono initiative where the Office provides information and a list of various referral organizations throughout the U.S. that can provide pro bono assistance to inventors.¹⁸ Many organizations and associations also provide legal assistance to inventors and innovators. For example, AIPLA has a Special Committee on Pro Bono designed to liaise with the USPTO and provide information to innovators. Organizations like Volunteer Lawyers for the Arts¹⁹ are dedicated to artists and creators, and in recent years, some have expanded their volunteer services to include patent and trademark support.

One popular and high-impact program for small business is the Small Business Innovation Research (SBIR)/Small Business Technology Transfer (STTR) programs. These U.S. government programs are designed to provide early-stage businesses with non-dilutive capital to solve a government agency problem. The award is administered in three phases, and the awardee company can elect to retain the intellectual property resulting from the research. Several agencies also provide additional “Technical and Business Assistance” (TABA) funding, authorized in the 2019 John S. McCain National Defense Authorization Act²⁰. This supplemental funding can help entrepreneurs with IP strategy, IP landscape, and in some cases patent-drafting expenses.

Many other public-private, government, state, and legal organizations do their part to help in sharing their time, talent, and resources to remove barriers in

¹⁸ USPTO Patent Pro Bono Program for independent inventors and small businesses (<https://www.aipla.org/committees/probono>) accessed April 2021

¹⁹ Volunteer Lawyers for the Arts <https://vlavy.org/> (accessed April 2021)

²⁰ TABA: Supplemental SBIR/STTR (<https://hbcetc.com/federal-funding/taba-supplemental-sbir-sttr-funding-you-might-not-know-about/>) accessed April 2021

our innovation ecosystem. However, a disconnect still remains particularly with respect to helping women and people of color learn what resources, both human and material, are available to assist them. Outreach, education and awareness are so vitally important.

IV. Diversity in the Legal Community

In the legal community, we hear time and again about the need for diverse attorneys to work with diverse innovators, meaning we must be actively committed to diversifying the intellectual property bar. Using diverse intellectual property professionals to engage with diverse innovators can inject a sense of understanding, cultural familiarity, and a feeling of relatedness among diverse innovators.

For example, corporate legal departments can support R&D efforts by engaging more women to:

- Use diverse legal providers to *model* the value of diversity of thought and bring additional disruptive ideas into the innovation process;
- Conduct innovation forums focused on the inclusion of women in the innovation process;
- Encourage R&D leaders to create racial, ethnic, and gender-inclusive teams where diverse experience and backgrounds can create novel, non-obvious solutions;
- Facilitate the creation of synergistic situations where teams of gender-diverse backgrounds interact and innovate together creating highly innovative solutions garnering more forward patent citations; and

- Identify diverse inventors and diverse legal providers as role models and mentors for others.

Diverse legal providers can help in-house teams see opportunities from a new perspective. For example, many companies and industry groups have begun to host women-focused innovation fora, which dovetail with supplier diversity efforts. These kinds of fora help companies find suitable minority suppliers, and also tap into findings that consistent successful innovation requires diverse thought and a solid understanding of the target consumer.²¹ These are both areas where minority or women-focused fora and networks can help individuals with relevant knowledge connect, collaborate, and innovate.

Intellectual property requires highly skilled professionals. In an effort to improve the number of diverse legal providers, the USPTO has recently published a request for comments²² on proposed administrative updates to the General Requirements Bulletin for Admission to the Examination for Registration to Practice in Patent Cases Before the United States Patent and Trademark Office (GRB). There are three categories of technical and scientific qualifications for applicants: **Category A** for specified bachelor's degrees; **Category B** for other bachelor's degrees with technical and scientific training; and **Category C** for practical engineering or scientific experience, which may be demonstrated by passing the Fundamentals of Engineering test. The USPTO evaluates the criteria for applicants to sit for the registration examination on

²¹ E. Almquist, *et al.* "Taking the measure of your innovation performance," Bain & Company 2013 at page 3, available at http://www.bain.com/images/BAIN_BRIEF_Taking_the_measure_of_your_innovation_performance.pdf (last accessed Nov. 23, 2016).

²² See "Administrative Updates to the General Requirements Bulletin for Admission to the Examination for Registration to Practice in Patent Cases Before the United States Patent and Trademark Office" (<https://public-inspection.federalregister.gov/2021-05940.pdf>) accessed April 2021

an ongoing basis, and based on this ongoing evaluation, the USPTO is looking into changing the criteria to: add common Category B degrees to Category A, accept advanced degrees (i.e., master's and doctoral degrees) under Category A, and accept a combination of core sciences under Options 2 and 4 of Category B, provided one of the core science courses has a lab component.

According to a recent study²³, qualified women are unnecessarily excluded from patent bar membership by the current USPTO scientific and technical requirements. This paper explores and criticizes the obstacles prohibiting women from equal representation in the patent bar and proposes possible solutions to include more women to the bar. Specifically, the author argues that the USPTO can foster greater inclusion and innovation in the U.S. patent system by: (1) expanding the enumerated technical degrees that automatically satisfy the scientific and technical requirements for patent bar eligibility; (2) removing the undue requirements regarding program accreditation (for computer science degrees) and coursework; and/or (3) implementing an apprentice model as an alternative path to patent bar eligibility²⁴.

In furtherance of the discussion about the possibility of revising the patent eligibility criteria, scholars have argued²⁵, as to design patents, the USPTO applies its eligibility rules too strictly as to those professionals who may only wish to draft design patents. The argument has been that, while chemical

²³ See "The Patent Bar Gender Gap: Expanding the Eligibility Requirements to Foster Inclusion and Innovation in the U.S. Requirements to Foster Inclusion and Innovation in the U.S. Patent System" by Mary Hannon (<https://www.repository.law.indiana.edu/cgi/viewcontent.cgi?article=1056&context=ipl>) accessed April 2021

²⁴ *Id.*

²⁵ See "The Design Patent Bar: An Occupational Licensing Failure" by Jean Curtis (https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3245319) accessed April 2021

engineers can prosecute both utility patents and design patents, under the current rules, industrial designers are not eligible to sit for the patent bar to prosecute design patents, even though the USPTO actively recruits industrial design professionals and architects as design patent Examiners. The argument further provides the USPTO's rules produce a substantial disparate impact on women's access to a lucrative part of the legal profession, and furthermore, poses a barrier to women who wish to work with other women in patenting their designs. By requiring those seeking to practice design patent prosecution to have science and engineering credentials, the majority of whom are men, she argues that the USPTO's rules disadvantage an entire pool of women patent professionals²⁶ who could be working with women innovators. AIPLA is currently reviewing the USPTO's proposed changes and may provide comments in the coming weeks.

As an organization, we have served to support diverse professionals for decades²⁷. Our mission at AIPLA is to "lead and serve a diverse IP community by enhancing knowledge and shaping the future of IP law." We accomplish this mission through our committees, such Women in IP Law, Diversity in IP Law, Mentoring, and Special Committee on Pro Bono, to name a few.

²⁶ *Id.*

²⁷ AIPLA Diversity Statement (<https://www.aipia.org/about/about-us/Diversity-Statement?SSO=Y>) accessed April 2021.

We have commissioned white papers²⁸ exploring the pay disparity impacting women in IP Law, and each year we launch an economic survey²⁹ that examines the economic aspects of intellectual property law practice, including individual billing rates and typical charges for representative IP law services. Our most recent economic survey indicates overall, the percentage of women in IP law responding to the survey has continued to hover around 20%, and the largest minority group other than women has consistently been the AAPI community (Asian American and Pacific Islander). Recent AIPLA Economic Survey data further reveal the percentage of private firm partners to private firm associates broken out by diverse groups. For example, the data shows 15% of private firm partners are women while 19% of associates are women. The data indicates 0.6% firm partners are African-Americans while 3.8% of associates are African-Americans. For the AAPI community, the ratio is higher, wherein the AAPI community makes up 5.1% of firm partners while 3% of firm associates are AAPI community members. And roughly 1.5% private firm partners are of the Latinx community while 1.5% of associates are Latinx.

Our Association is also committed to ensuring a pipeline of diverse legal talent. The Foundation for Advancement of Diversity in IP Law (formally known as the AIPLEF, which we helped co-found with the ABA-IPL Section more than two decades ago) supports members of underrepresented racial and ethnic groups in their pursuit of careers in intellectual property law in the United States. The Foundation's programs work toward:

²⁸ See State of Women in IP Law ([https://higherlogicdownload.s3.amazonaws.com/AIPLA/50774790-aba5-41c8-aea9-9fc7030d3b1d/UploadedImages/WIP/AIPLA-](https://higherlogicdownload.s3.amazonaws.com/AIPLA/50774790-aba5-41c8-aea9-9fc7030d3b1d/UploadedImages/WIP/AIPLA-Women%20in%20IP%20law%20survey%20results%20whitepaper%20FINAL%20.pdf)

[Women in IP law survey results whitepaper FINAL 2 .pdf](https://higherlogicdownload.s3.amazonaws.com/AIPLA/50774790-aba5-41c8-aea9-9fc7030d3b1d/UploadedImages/WIP/AIPLA-Women%20in%20IP%20law%20survey%20results%20whitepaper%20FINAL%20.pdf)) accessed April 2021

²⁹ AIPLA Report of the Economic Survey (<https://www.aipla.org/home/news-publications/economic-survey>) accessed April 2021

- Increasing the awareness of the IP profession among underrepresented racial and ethnic groups and supporting their participation in the IP profession;
- Providing financial support to individuals from underrepresented racial and ethnic groups who demonstrate an interest in a career in IP law; and
- Accelerating development of a more diverse IP professional community through networking, counseling, and mentoring efforts aimed at fostering career advancement of individuals from underrepresented racial and ethnic groups.

AIPLA agrees more work needs to be done to remove unnecessary barriers and obstacles in order to increase the number of women and diverse professionals in the patent bar.

V. Patent Pro Bono Access For Diverse Innovators

The patent prosecution process is not easy for the novice to navigate. It will come as no surprise that cost is a substantial barrier to our patent system for many diverse innovators, even though many inventors understand that a significant step to protecting their innovation is to obtain a patent. According to Mark R. Privratsky and Jennifer McDowell³⁰, when faced with the complex and sometimes expensive process of patent prosecution, many low-income inventors conclude that they must proceed pro se or not at all. Fortunately, many inventors apply the same resolve and determination they used to conceive their inventions and tackle the problem head-on. Despite the

³⁰ See Ethical Representation of Every Client: Paying or Pro Bono by Mark R. Privratsky and Jennifer McDowell published at AIPLA Annual Conference, October 2015

substantial efforts the USPTO has made to educate independent inventors and to make the system more accessible, an inventor may nevertheless find the patent process confusing and complicated. Diverse innovators may be more likely to give up when trying to navigate the patent process on their own. As one way to address this need, patent pro bono was born.

The Leahy-Smith America Invents Act called upon the USPTO to work with and support intellectual property law associations across the country to establish pro bono programs designed to assist financially under-resourced independent inventors and small businesses. As a precursor to the Act, in early 2010, the USPTO, along with representatives from the Minnesota law firms Patterson, Thuente, Christensen, Pedersen, P.A. and Goodman of Lindquist & Vennum PLLP had already begun discussing how to create a program to eliminate the financial hurdles that often prohibit independent inventors from patenting and bringing great ideas to market.³¹ Before long, with the help and efforts of other Minnesota colleagues, the first patent law pro bono program became a reality. The team from Minnesota formed various committees which worked toward securing funding, setting processes and procedures, recruiting volunteers, and generating nationwide buzz and support. A first-of-its-kind program, the Legal CORPS Inventor Assistance Program (IAP), launched in Minnesota on June 8, 2011, matching patent prosecution attorneys willing to provide pro bono legal assistance with inventors having already filed pro se patent applications for their inventions³².

³¹ *Id.*

³² *Id.*

In the years since the launch of the initial patent pro bono effort, the program has expanded to a nationwide network of independently operated regional programs that match volunteer patent professionals with financially under-resourced inventors and small businesses for the purpose of securing patent protection. Each regional program provides services for residents of one or more states³³. While the patent pro bono is not specifically targeted to women and people of color, early indicators suggest this initiative is already positively impacting these communities for many reasons, not the least of which because the practitioner provides legal services to the innovator at no cost.

³³ Patent Pro Bono Program for independent inventors and small businesses (<https://www.uspto.gov/patents/basics/using-legal-services/pro-bono/patent-pro-bono-program>) accessed April 2021

VI. Conclusion

AIPLA appreciates the substantial effort of this undertaking by the Subcommittee and the opportunity to participate in the development of a very important dialogue on how to improve access and inclusivity in our patent system. We will continue to be engaged, and lead the way on this issue, and we are willing to respond to any questions you may have. We look forward to working with the Subcommittee on this important challenge as circumstances allow.

WRITTEN STATEMENT

By [Mallun Yen](#), Founder, Operator Collective
April 20, 2021

Good morning, everyone. Thank you for inviting me today. I'm Mallun Yen, and I've spent my career furthering innovation -- starting in the patent field and now working with startups, and always working in parallel to advance underrepresented groups. So I'm an unusual combination of IP attorney, operator, founder, and investor.

Because there tends to be more data on women than other categories, for shorthand today, I refer to "women" as a proxy for women, people of color, and other underrepresented groups. But my comments are not limited to women.

My background in patents

For many years, I was the VP of Worldwide Intellectual Property at Cisco. When I was promoted to that position in 2005 there were so few women Chief Patent Counsels that it was front-page news. That led all seven of us to start a nonprofit called ChIPs, which is the world's largest organization for women in patent law with almost 4,000 members in 17 chapters worldwide. My ChIPs co-founder, Michelle Lee, was the first and still only woman, as well as the first and still only person of color, to serve as a Senate-confirmed Director of the USPTO in its 219 year history. I then built up a startup called RPX that helps companies reduce and insure against patent risk. I'm also a member of the National Council for Expanding American Innovation.

Bringing diversity to venture capital

A few years ago, I actually invented something new -- the collective venture model, which serves as the basis of my current startup, a venture capital fund called Operator Collective. I'd been spending a lot of time on the periphery of venture capital and noticed a few things, namely that the venture world revolves around VCs and founders, both homogeneous groups which at the time were [about 90% male](#), predominantly white, and [40% of whom went to Harvard or Stanford](#).

But having been a founder, investor, and an operator, I saw a huge piece missing -- a piece that's critical to the success of any startup: operators. In the world of venture, operators are the people who join the company as it needs to grow. They are not typically in the limelight, but spend their time building and scaling all of these successful companies in the background.

So here are these wildly experienced operators who have exactly the right knowledge and skill sets to help new businesses grow and thrive, but they're typically left out of the venture equation. Most people aren't intentionally trying to exclude these operators, it's just that the system was not friendly to people who give 150% to their day jobs and use any time leftover for their families and friends.

I *knew* operators were the critical missing piece in venture capital, and since the traditional model didn't work for them, I created a new model that would. We tore down the traditional fund structure and rebuilt it from the ground up to optimize for bringing in busy women operators. To do so, we added three things: education, accessibility, and representation.

- **EDUCATION.** We knew women didn't have access to the right information, so created programs to educate and engage.
- **ACCESSIBILITY.** We knew one big hurdle was the cost of entry, so we created a sliding scale for financial participation. Another obstacle was the rigid structure, so we made it flexible in terms of time commitments.
- **REPRESENTATION.** Knowing women are often criticized for self promoting, we built a supportive community that does it for them.

In short, we made it easier and more user friendly for them, and turned their preferred way of operating into a core part of the model that actually made it stronger. Today, our \$51M fund has over 130 operator investors who are 90% women and 40% people of color, over 70% of whom had never invested in venture before.

How this relates to patents and innovation

There are several parallels to what's going on in the world of patents. [According to the National Bureau of Economic Research](#), "children born to parents in the top 1% of the income distribution are ten times as likely to become inventors as those born to families with below-median income, and whites are more than three times as likely to become inventors as blacks." And according to the [Public Library of Science](#), "women's rate of patenting has increased from 2.7% of total patenting activity to 10.8%" in 40 years. Assuming a consistent rate of increase, it would take 194 years to increase that to 50%.

Securing a patent is complex, daunting, and expensive. You have to learn a system that uses terms outside of everyday language, you need the time to dedicate to it on top of your job and family obligations, and you have to have the financial means to navigate the process. Once you've completed the process once, it's less intimidating, but the barriers to entry are huge.

The system wasn't built for inventors like Ms. Edwards. If we want to capture the innovations that reflect the contributions of all of America, we need to evolve the system to make it more accessible to everyone. That includes the same three things: education, accessibility, and representation.

- **EDUCATION.** We have to make it easier to navigate the process, instead of first-time inventors having to complete a monumental journey just to know where to begin, with

deliberate outreach to underrepresented communities early and consistently.¹

- **ACCESSIBILITY.** We must make it more accessible in terms of access to resources and financial commitments. The [Leahy-Smith America Invents Act of 2011](#) added four satellite PTO offices, which was a good start, but more would be better. Another idea is to revisit the USPTO's patent pro bono program, potentially to adjust it to apply to underrepresented groups with a traditionally low rate of patenting.²
- **REPRESENTATION.** We must highlight inventors from diverse backgrounds in order to create a new normal and change the voices that are highlighted. This includes appointing a USPTO Director from an underrepresented background.

Finally, there is one fundamental piece that underlies this all, and it's something the tech industry has been doing for years: data. We cannot measure progress if we do not track our data and results.

[According to the National Bureau of Economic Research](#), "relatively little is known about the individuals who become inventors in the modern era in the U.S. This is because most sources of data on innovation (e.g., patent records) do not record even basic demographic information, such as an inventor's age or gender." Senator Hirono's IDEA Act goes a long way toward ensuring this fundamental piece.³

Thank you for your time and attention.

¹ Some corporations, like HP and Cisco, have already begun to implement programs to encourage underrepresented groups to participate in the patent process with early success. Since Cisco launched its program in 2020, over 200 women have participated, resulting in 48 invention disclosures and a dozen accepted for filing as applications, according to Dan Lang, Cisco's Vice President, Intellectual Property and Deputy General Counsel. In most corporations, employees receive a monetary award based on patent filings and also sometimes for submitting patent disclosures. Beyond these awards, patents have also been known to enhance careers, with increased peer and professional recognition, leadership opportunities, opportunities for collaboration, and ultimately increased pay. [Equity in Innovation: Women Inventors and Patents](#), *Institute for Women's Policy Research*, 2016 citing Stevens, Johnson, and Sanberg 2011; Association of Public & Land-Grant Universities 2015; Rosser 2009.

² [USPTO's Pro Bono Program](#): In general, the requirements for admission are: Income (Your gross household income should be less than three times the [federal poverty level guidelines](#), though some regional programs may have different criteria), Knowledge (You must demonstrate knowledge of the patent system in one of two ways: Having a provisional application already on file with the USPTO, or successful completion of the [certificate training course](#)), and Invention (You must be able to describe the particular features of the invention and how it works).

³ Along these lines, one way to jumpstart data collection is to compile that data by amending the Inventor Oath and Declaration (37 CFR 1.63). For pending applications, all applicants should be required to file an updated Oath and Declaration that includes demographic information (at the office action phase or prior to the notice of allowance issuing). For issued patents, applicants should provide that information when maintenance fees are due or any other touch points that the inventors/assignees have with the USPTO. Thank you to Vaishali Udupa, HPE's Associate General Counsel, for this excellent suggestion.

**Questions for the Record of Senator Patrick Leahy
Chair, Intellectual Property Subcommittee
Hearing on: "Improving Access and Inclusivity in the Patent System: Unleashing
America's Economic Engine"
April 21, 2021**

Question for Ms. Angela Grayson

1. Changes in technology, including improvements in search functionality for examiners, have the potential to make the patent examination process significantly more efficient. My understanding is that the PTO is also developing a search tool to allow the public to search comparable patents before having to go through the lengthy process of submitting patent applications and paying the requisite fees.
 - a. **Do you think expanding availability of any forthcoming search technology to allow for public use will help improve access and inclusiveness for inventors?**
 - b. **In what ways would our patent system become more efficient if the members of the public can use stronger tools to search through existing patents and other prior art before going through the process of submitting a patent application?**



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Improving Access and Inclusivity in the Patent System: Unleashing America's Economic Engine

Testimony Submitted to the Senate Judiciary Subcommittee on Intellectual Property

Lateef Mtima

Howard University School of Law

April 21, 2021

Thank you Chairman Leahy, Ranking Member Tillis, and Members of the Intellectual Property Subcommittee for holding this important hearing on Improving Access and Inclusivity in the Patent System. My name is Lateef Mtima and I am a Professor of Law at the Howard University School of Law and the Director of the Institute for Intellectual Property and Social Justice.¹ I appreciate your invitation to testify today in connection with this subject that is critical to the national interest.

When America makes full use of her vast reservoir of the most diverse pool of human innovative and creative capability on the planet, there is no challenge we cannot meet, no achievement we cannot attain. When in 1961 President John F. Kennedy set forth the challenge of placing an American on the moon within a decade, by harvesting American capability without regard to race or gender, we not only met the challenge we surpassed it.²

Unfortunately making full use of American capability is not always the case for our patent system or our intellectual property ecosystem as a whole; too much of America's intellectual potential, from Marion, Virginia to Greencastle, Indiana, to Compton, California, is too often undeveloped and untapped. To paraphrase blues great Robert Cray, like food left out all night, it's talent gone to waste. Systemic inequities relating to race, gender, socio-economic class, and even geographic situs, as well as structural imperfections in the IP system³ buttressed by a philosophical indifference toward the social justice obligations and opportunities of IP protection, have at times stunted the social efficacy of our IP system.⁴

¹ The Institute for Intellectual Property and Social Justice is a non-profit organization established to promote social justice in the field of intellectual property law and practice. Advocating for core principles of socially equitable access, inclusion, and empowerment throughout the IP ecosystem, IIPSI's work includes scholarly examination of IP law from a social justice perspective; advocacy for social justice in the shaping and implementation of IP law and policy; initiatives to increase the diversity of the IP bar; and programs which promote greater awareness and understanding of IP protection, particularly among historically and currently disadvantaged and underserved groups.

² MARGOT LEE SHETTERLY, *HIDDEN FIGURES: THE AMERICAN DREAM AND THE UNTOLD STORY OF THE BLACK WOMEN WHO HELPED WIN THE SPACE RACE* (HARPER COLLINS 2016); CHARLES FISHMAN, *ONE GIANT LEAP: THE IMPOSSIBLE MISSION THAT FLEW US TO THE MOON* (SIMON & SCHUSTER 2019).

³ See e.g. Matthew Boltman, *For Black Inventors, Road to Owning Patents Paved with Barriers*, *Bloomberg Law*, I.P. Law News, (July 14, 2020); Miriam Marcowitz-Bittou and Emily Michuko Morris, *The Distributive Effects of IP Registration*, 23 *Stan. Tech. L. Rev.* 306, 315-17 (2020) (proposing anonymous patent application procedures and implicit bias training for patent examiners); W. Michael Schuster, R. Evan Davis, Kourtney Schley, and Julie Ravenscraft, *An Empirical Study of Patent Grant Rates as a Function of Race and Gender*, 57 *Am. Bus. L. J.* 281 (2020); Robert Brauner & Dotan Olur, *An Empirical Study of the Race, Ethnicity, Gender and Age of Copyright Registrants*, 86 *GEO. WASH. L. REV.* 46 (2018); Jessica Milli, Emma Williams-Baron, Meika Berlan, Jenny Xia, and Barbara Gault, *Equity in Innovation: Women Inventors and Patents*, [C448-Equity-in-Innovation.pdf](https://www.ippr.org/C448-Equity-in-Innovation.pdf) (ippr.org).

⁴ See e.g., Kara Swanson, *Race and Selective legal Memory: Reflections on "Invention of a Slave"*, 120 *Columbia Law Review* 1077 (2020); Brian L. Frye, *Invention of a Slave*, 68 *Syracuse L. Rev.* 181 (2018); Shontavia Jackson Johnson, *The Cuboblood*



Whether due to a lack of the necessary knowledge of and opportunity to participate in IP endeavor, or the result of exploitative traditions perpetuated in some IP industries, through circumstance and choice, some Americans languish outside the IP ecosystem.⁵ Whatever the causes, it is critical that we appreciate that whatever the opportunity loss to individual innovators and creators, the greatest loss is to our nation as a whole. Systemic impediments to broad participation in IP enterprise sap the vitality of our IP ecosystem. They undermine the social function of intellectual property protection of *maximizing* IP participation and the beneficial qualitative and quantitative contributions essential to our technological development, cultural advancement, and economic welfare.⁶

Improving Access and Exclusivity in the Patent System: A Social Justice⁷ Perspective Towards the IP Ecosystem

For these reasons, today I would like to applaud the present initiative of the Judiciary Subcommittee to Improve Access and Inclusivity in the Patent System and thereby Unleash America's Economic Engine. I believe this initiative reflects a social justice-oriented perspective towards our innovation ecosystem, and places the aspirational principles of equitable access, inclusion, and empowerment at the center of our intellectual property regime.

The social justice perspective of intellectual property law contemplates an *inmate and interdependent relationship* between the social utility function of IP protection and the social justice obligations and effects of that regime. In order to fulfill its purpose of promoting socially beneficent intellectual activity, the intellectual property system must be structured and administered so as to promote the most widespread and socially equitable participation therein.⁸

Patent System and Black Inventors, *Landslide* Vol. 11 No. 4, (American Bar Association 2019), https://www.americanbar.org/groups/intellectual_property_law/publications/landslide/2018-19/march-april/colorblind-patent-system-black-inventors/; K.J. Greene, *Intellectual Property at the Intersection of Race and Gender: Lady Sings the Blues*, 16 *Am. U. J. Gender Soc. Pol'y & L.* 365 (2008); Sean O'Connor, *The Lead Sheet Problem in Music Copyright*, THE CAMBRIDGE HANDBOOK ON IP AND SOCIAL JUSTICE (forthcoming 2021).

⁵See James Keene, *Giants of The Past: Percy Lowell Julian (1899-1975)*, <https://www.ars.usda.gov/research/publications/publication/?seqNo115=215771>.

⁶ See Schuster, Davis, et. al. at 311-14 ("[I]nvention [is] 'an established driver of long-term economic growth.' That goal is undermined where significant portions of the population are disincentivized from pursuing careers in innovation or undertaking acts of invention... First, society loses would-be great inventors where large groups are disenfranchised from participating in invention. Second, the quality of invention diminishes in the face of largely homogeneous inventors... Bell et al. describe the misallocation of potentially talented inventors into other professions where their natural gifts are squandered. This concept—dubbed 'Lost Einsteins'—relies on career-allocation mechanisms unrelated to intelligence or aptitude for invention... [and] deprives society of a *quantum* of new inventors, and... improved *quality* of invention... Diverse groups of inventors... explore a wider scope of solutions and are more likely to arrive at an efficient resolution relative to a homogenous group"). Lisa D. Cook, *Racism Impoverishes the Whole Economy*, *N.Y. Times*, November 18, 2020.

⁷ While the term "social justice" is best defined in the context of a specific issue, social justice is commonly understood to mean "fair treatment of all people in a society, including respect for the rights of minorities and equitable distribution of resources among members of a community." <https://www.dictionary.com/browse/social-justice>. See also <https://www.investopedia.com/terms/s/social-justice.asp> ("Social justice is a political and philosophical theory which asserts that there are dimensions to the concept of justice beyond those embodied in the principles of civil or criminal law, economic supply and demand, or traditional moral frameworks... Historically... the idea of social justice is that all people should have equal access to wealth, health, well-being, justice, privileges, and opportunity regardless of their legal, political, economic, or other circumstances.")

⁸ See LATEEF MITRA, *INTELLECTUAL PROPERTY, ENTREPRENEURSHIP AND SOCIAL JUSTICE* (EDWARD ELGAR 2015); Margarita Choi, *Intellectual Property and the Development Divide*, 27 *Cardozo L. Rev.* 2821 (2006); Peter Menell, *Property, Intellectual Property*



An intellectual property system designed to guarantee socially equitable access to its apparatus and to its benefits irrespective of wealth, class, race, ethnicity, or geographic situs, ensures that the widest possible network of minds and hearts will find the inspiration to conceive, invent, express, share, and experience intellectual accomplishment. The socially just construction, application, and enforcement of intellectual property rights assures the equitable inclusion of all citizens, including marginalized members of society, and preserves everyone's secular incentives to not only undertake IP endeavor but to disseminate widely the fruits of their intellectual labors. And socially balanced exploitation of intellectual property product helps to equalize health and education standards, promotes socio-economic empowerment and self-uplift, and ultimately fosters universal respect for the intellectual property system overall.

And lest there be any needless misapprehension as to whether the social justice perspective of intellectual property protection can accommodate economic considerations, it should be understood that commercial enterprise is an essential element of the IP Social Justice perspective. While human instinct provides natural and powerful motivation to create and invent, secular incentives and opportunities can augment the innate drive to achieve. Accordingly, the intellectual property regime properly employs economic as well as non-secular incentives to promote engagement in intellectual endeavor.⁹ Perhaps even more germane to the Subcommittee's present initiative, economic participation incentives can be especially critical to those whose socio-economic circumstances and options are such that dedication to innovative and creative pursuits demands great personal and communal sacrifice.¹⁰

Specific Recommendations for Improving Access and Inclusivity in the Patent System

In support of the Subcommittee's efforts to devise a strategy to address these issues, I would respectfully offer the following recommendations:

i) A National Grassroots Community IP Education Program

For many Americans, the phrase "intellectual property" is intimidating and mysterious. Many inventors and artists are wholly unfamiliar with intellectual property terms, laws, and administrative procedures. In fact, some innovators and creators view the IP system with trepidation and suspicion, more as an obstacle to their entrepreneurial dreams than a system for protecting the fruits their intellectual labors.¹¹ Through "grassroots"

and Social Justice: Mapping the Next Frontier, 5 Prop. Rights Con. J. 147 (2016); MADHAVI SUNDER, FROM GOODS TO A GOOD LIFE (2012).

⁹ Latief Mufim, *IP Social Justice Theory: Access, Inclusion, and Empowerment*, 55 Gonz. L. Rev. 401, 417 (2019/2020) ("Human beings often direct their intellectual energies toward creative and inventive endeavor as a matter of innate curiosity, aesthetic inspiration, or utilitarian needs. The human drive toward self-expression and useful innovation has been manifest since the first cave paintings and the invention of the wheel. Nonetheless, material incentives to undertake specific kinds of intellectual endeavor can further stimulate such activity.")

¹⁰ See e.g. Justin Hughes & Robert P. Merges, *Copyright and Distributive Justice*, 92 NOTRE DAME L. REV. 513 (2016); MUFIM, INTELLECTUAL PROPERTY, ENTREPRENEURSHIP AND SOCIAL JUSTICE at xvii ("To gain control over your intellectual property – the products of your mind, talent, and cultural traditions – is to gain control over resources that can give you the leverage to do business in the national and global marketplace on a level playing field.")

¹¹ Indeed, inventor and entrepreneur mistrust often extends to patent attorneys and professionals. Accounts of the predatory exploitation of unsuspecting inventors and creators run the gamut. In addition to the familiar, sham "patent acquisition" companies which entice inexperienced inventors with baseless promises to obtain patents on their behalf, one recent client of the Howard Law School IP Clinic recounted how one firm had previously offered to secure a "patent" to protect her fiction novel, for a fee of \$30,000



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community IP education programs, government IP public outreach personnel can recruit and collaborate with private sector IP attorneys and experts who have relationships with IP-underserved communities, to conduct basic IP awareness and information seminars in local venues of social, civic, and communal congregation. These programs could also provide the added benefit of connecting local entrepreneurs with IP attorneys familiar with their relevant background experiences, unique interests, and special concerns.¹²

ii) A Low-Income Inventor "Pre-prosecution Patentability Assessment" Pilot Program

While compliance with the administrative and legal prerequisites to patent protection can be daunting, there is little doubt that the sheer cost of obtaining a patent can present an absolute bar to patent acquisition.¹³ Even for those small to medium inventors who can manage to pull together the funds needed to pursue patent prosecution, the process may nonetheless appear to present an all-or-nothing gambit, weighing the risk of financial exhaustion against the possible prize of a patent grant. In some situations, a preliminary confirmation of patent viability could signal an opportunity "to get in on the ground floor" and induce venture capitalists and others to underwrite the expense of patent prosecution. The development of a pilot initiative in the U.S. Patent Office, through which inventors with limited financial resources could obtain minimal/no fee "pre-prosecution patentability assessments", would enable such inventors and interested investors to identify promising applications which warrant the expense of patent prosecution, while concomitantly avoiding the expenditure of precious resources on applications unlikely to prove successful.

iii) A Study on IP and K-12 Education

While American grade school students are routinely exposed to the wonders of science and art, the relationship between these subjects and intellectual property is rarely if ever explored. Little wonder then, that many young scientists, technologists, and artists misperceive intellectual property rights as the concern of those who pursue intellectual pursuits solely for selfish, commercial gain. Grade school and undergraduate students should be taught how the products of scientific and artistic study benefit society through the broad dissemination attendant to commercialization. The commission of a study as to how intellectual property concepts can be appropriately introduced into K through 12 and undergraduate arts and sciences education, can help to close the pedagogical divide between these complementary disciplines.

Conclusion

Equipped with knowledge of and genuine access to the patent system and the IP ecosystem as a whole, everyday Americans can harvest their inventive and creative potential to empower themselves and benefit their communities through entrepreneurial enterprise and civic engagement. Our nation can no longer afford fallow tracts of human potential. Contribution to America's scientific, technological, and cultural advancement is both the privilege and the responsibility of every citizen, and promoting the widest participation in this enterprise

¹² Rita S. Heimes, *Lawyers and Innovation*, INTELLECTUAL PROPERTY, ENTREPRENEURSHIP AND SOCIAL JUSTICE at 119.

¹³ Gene Quinn, *The Cost of Obtaining A Patent in the US*, <https://www.ipwatchdog.com/2015/04/04/the-cost-of-obtaining-a-patent-in-the-us/id-56485/>; <https://kmipec.com/patent-prosecution-costs/#~:text=Patent%20prosecution%20costs%20will%20be%20more,and%20the%20patent%20is%20granted:How%20Much%20Does%20a%20Patent%20Cost?>; <https://blueironip.com/how-much-does-a-patent-cost/>.



serves our national interests. By implementing the social justice aspirations of equitable access, inclusion, and empowerment in the administration of our intellectual property system, we can fulfill the best and highest function of IP protection: to foster human nourishing, flourishing, and actualization by promoting beneficent intellectual endeavor.

**Questions for the Record of Senator Patrick Leahy
Chair, Intellectual Property Subcommittee
Hearing on: “Improving Access and Inclusivity in the Patent System: Unleashing
America’s Economic Engine”
April 21, 2021**

Question for Professor Lateef Mtima

1. Would you support cultivating a diverse group of patent and trademark examiners by holding job fairs at Historically Black Colleges and Universities, Tribal Colleges, and universities and institutions that serve large Hispanic populations? What other methods would you suggest for identifying and recruiting a more diverse group of patent and trademark examiners?

**Questions for the Record of Senator Patrick Leahy
Chair, Intellectual Property Subcommittee
Hearing on: “Improving Access and Inclusivity in the Patent System: Unleashing
America’s Economic Engine”
April 21, 2021**

Question for Ms. Mallun Yen

1. I understand that the Patent Trial and Appeal Board has held more oral hearings following enactment of the Leahy-Smith America Invents Act. I also understand that the Board has started a program—the LEAP Program—to encourage younger attorneys, including women and attorneys of color, to argue at those hearings by allowing LEAP participants more argument time and more support from senior attorneys.
 - a. **In what ways has the LEAP Program encouraged a more diverse array of attorneys to participate in PTAB hearings?**
 - b. **Are there any other ways the PTAB could encourage the participation of younger and more diverse attorneys?**

Senator Tillis Questions for the Record – Improving Access and Inclusivity in the Patent System: Unleashing America’s Economic Engine

Ms. Georgia Grace Edwards

1. What recommendations do you have to increase the participation of marginalized and underrepresented groups in the patent system?
2. What does success look like to you in terms of improving access and inclusion in the innovation ecosystem and what steps will it take to get there?
3. What initiatives in this area have been particularly successful, in your perspective?
4. Where do you think main obstacles are towards achieving this goal? How do you recommend addressing the issue?
5. What advice do you have for underrepresented entrepreneurs and innovators?
6. Your company, SheFly, has a patent pending zipper design. What made you decide to apply for a patent?
7. Did you feel that the process itself may have been biased?
8. Do you think it had a positive effect on the willingness to attract other investors?

Senator Tillis Questions for the Record – Improving Access and Inclusivity in the Patent System: Unleashing America’s Economic Engine

Ms. Grayson:

1. What recommendations do you have to increase the participation of marginalized and underrepresented groups in the patent system?
2. What does success look like to you in terms of improving access and inclusion in the innovation ecosystem and what steps will it take to get there?
3. What initiatives in this area have been particularly successful, in your perspective?
4. Where do you think main obstacles are towards achieving this goal? How do you recommend addressing the issue?
5. What advice do you have for underrepresented entrepreneurs and innovators?
6. In your experience what are some important considerations for the PTO to consider when looking at how to increase diversity and inclusion in the patent system?

Senator Tillis Questions for the Record – Improving Access and Inclusivity in the Patent System: Unleashing America’s Economic Engine

Professor Lateef Mtima

1. Assuming the USPTO were to collect demographic data, are there ways that the USPTO can establish a lack of bias, or otherwise address the issue, when it asks applicants to voluntarily submit application data?
2. What additional data points related to the innovation ecosystem would be useful to help researcher? What agencies or other organizations could contribute to collecting such data?
3. What recommendations do you have to increase the participation of marginalized and underrepresented groups in the patent system?
4. What does success look like to you in terms of improving access and inclusion in the innovation ecosystem and what steps will it take to get there?
5. What initiatives in this area have been particularly successful, in your perspective?
6. Where do you think main obstacles are towards achieving this goal? How do you recommend addressing the issue?

Senator Tillis Questions for the Record—Improving Access and Inclusivity in the Patent System: Unleashing America’s Economic Engine

Ms. Mallun Yeh

1. What lessons can you bring from your experience as an operator to help improve access and inclusivity? What works, what does not?
2. How can data be used to improve access and inclusivity in the innovation ecosystem?
3. What areas should researchers focus on to have the most impact?
4. What role should the NCEAI have moving forward for the USPTO?
5. What would you like to see the Council accomplish?
6. What recommendations do you have to increase the participation of marginalized and underrepresented groups in the patent system?
7. What does success look like to you in terms of improving access and inclusion in the innovation ecosystem and what steps will it take to get there?
8. What initiatives in this area have been particularly successful, in your perspective?
9. Where do you think main obstacles are towards achieving this goal? How do you recommend addressing the issue?
10. What advice do you have for underrepresented entrepreneurs and innovators?

AIPLA

American Intellectual Property Law Association

September 8, 2022

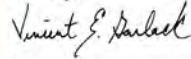
Kara Dubbs
Hearing Clerk
U.S. Senate
Committee on the Judiciary
152 Dirksen Senate Office Building
Washington, DC 20510

Dear Kara:

In response to your email of August 22, 2022, please find attached the responses of Angela Grayson in response to the proposed Questions for the Record (QFRs) related to the April 21, 2021, Hearing on: "Improving Access and Inclusivity in the Patent System: Unleashing America's Economic Engine."

Thank you for the opportunity to provide these responses and for the Committee's consideration of these views.

Sincerely,



Vincent E. Garlock
Executive Director
American Intellectual Property Law Association

**Questions for the Record of Senator Patrick Leahy
Chair, Intellectual Property Subcommittee
Hearing on: "Improving Access and Inclusivity in the Patent System: Unleashing
America's Economic Engine"
April 21, 2021**

Question for Ms. Angela Grayson

1. Changes in technology, including improvements in search functionality for examiners, have the potential to make the patent examination process significantly more efficient. My understanding is that the PTO is also developing a search tool to allow the public to search comparable patents before having to go through the lengthy process of submitting patent applications and paying the requisite fees.

a. Do you think expanding availability of any forthcoming search technology to allow for public use will help improve access and inclusiveness for inventors?

Response: Yes. It is important that inventors are empowered to do their own searching. Further, any tool the USPTO may be developing should be accompanied by a robust training program, and the tool should leverage natural language searching capabilities rather than simply Boolean techniques to maximize ease of use.

b. In what ways would our patent system become more efficient if the members of the public can use stronger tools to search through existing patents and other prior art before going through the process of submitting a patent application?

Response: The availability and use of stronger tools empowers inventors to self-screen at least the novelty of their inventions. Based on this self-screening, inventors: 1) may opt to avoid filing a patent application that is likely to be rejected; or 2) further refine their inventive concept to distinguish the prior art; or 3) continue the creative process to develop and define an invention that overcomes the prior art found.

Questions for the Record of Senator Thom Tillis
Ranking Member, Intellectual Property Subcommittee
Hearing on: “Improving Access and Inclusivity in the Patent System: Unleashing
America’s Economic Engine”
April 21, 2021

Questions for Ms. Grayson:

- 1. What recommendations do you have to increase the participation of marginalized and underrepresented groups in the patent system?**

Response: Create greater awareness of the various tools, training, resources, incentives and options available to inventors. To reach marginalized and underrepresented groups, the USPTO should focus its efforts on partnering with groups designed to serve that particular demographic.

- 2. What does success look like to you in terms of improving access and inclusion in the innovation ecosystem and what steps will it take to get there?**

Response: Measurable/verifiable metrics establishing that more people in marginalized and underrepresented groups are aware of the various tools, training, resources, incentives and options that exist for inventors. Whether these stakeholders choose to file for intellectual property protections is a business/personal choice for the inventor. Awareness of their options is a critical first step.

- 3. What initiatives in this area have been particularly successful, in your perspective?**

Response: Programs like I-CORPS do a great job helping NSF/SBIR awardee innovators create IP and commercialization plans. The program is a great example of what happens when the innovator is adequately trained on commercialization and IP strategy options related to their technology. While the program is not specific to underrepresented groups, it is a great example of how a highly targeted structured program can have a tremendous impact.

- 4. Where do you think main obstacles are towards achieving this goal? How do you recommend addressing the issue?**

Response: The main obstacles are deciding with which organizations to partner as well as providing enough funding to drive awareness so that the organizations do not bear the brunt of the effort financially. The USPTO should have the flexibility to partner with various organization with the highest potential to reach the community of interest. Empowering regional USPTO offices to execute this initiative may also be an effective way to achieve the goal.

5. What advice do you have for underrepresented entrepreneurs and innovators?

Response: Align with as many incubator and accelerator organizations as possible to network and learn, and to establish business mentor relationships. Successful business mentors most likely have lessons and experiences to share about their IP journeys in their respective businesses.

6. In your experience what are some important considerations for the PTO to consider when looking at how to increase diversity and inclusion in the patent system?

Response: Important considerations could include: 1) a conscious effort to ensure the USPTO Examiner Corp is diverse; 2) ensure any USPTO live trainers/virtual trainers are diverse or comprise a diverse panel of speakers; and 3) partner with more underrepresented-serving organizations on their business-related programming to reach underrepresented innovators. Investors are increasingly focused on impact investing and innovations that target underrepresented communities.



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Improving Access and Inclusivity in the Patent System: Unleashing America's Economic Engine

Responses to Specific Questions for the Record Submitted to the Senate Judiciary Subcommittee on Intellectual Property

Lateef Mima

Howard University School of Law

(Submitted September 12, 2022)

I would like to Thank Chairman Leahy, Ranking Member Tillis, and Members of the Intellectual Property Subcommittee for this opportunity to respond to specific Questions for the Record as interposed by Senator Leahy and Senator Tillis, and to thereby provide further insights and information in connection with the Subcommittee's initiative toward Improving Access and Inclusivity in the Patent System. I appreciate this further opportunity to support the Subcommittee's efforts to ensure that every American enjoys the opportunity to contribute to the nation's intellectual property ecosystem, in furtherance of the social justice aspirations and effects of intellectual property protection and to our nation's collective greater good.

In preface to the enumerated responses below, I would like to offer a few general observations relevant to shaping a national strategy for improving access and inclusivity in the patent system and throughout the IP ecosystem as a whole. As explored during the Hearing of the Senate Judicial Subcommittee of April 21, 2021, expanding public awareness and education in connection with the IP regime, particularly in communities that have been traditionally underserved, is essential to the success of this important effort, however, lack of knowledge of IP rules and requisites is not the sole barrier to increased and more diverse participation in the IP ecosystem. Decades of exploitative business practices in various IP industries enabled the misappropriation of the innovative and creative achievements of, and also the attendant recognition and financial rewards due to many marginalized innovators and creatives, which has engendered deep mistrust toward the IP regime in many such communities. Moreover, such inequities can manifest differently in the various fields of IP endeavor and business enterprise.¹ Consequently, in order to determine the full breadth and variegated nature of IP disaffection among these groups and communities, and develop effective strategies to dispel these apprehensions, Congress could appoint a small commission of experts in IP, small business entrepreneurship, and community education and engagement, to research and compile pertinent historical, anecdotal, and empirical data, and to provide specific recommendations toward systemic redress.

In effectuating a national strategy to enhance public participation in the IP ecosystem, Congress could replicate the approach it undertook to support the enforcement of private IP rights in its adoption of the Pro-IP Act in 2008, which established the office of the IP Enforcement Coordinator. In passing the Pro-IP Act, Congress acknowledged that given the importance of IP to the national interest,

¹ See e.g., *Black founder of Internet domain registry: Network Solutions, reminisces on racial barriers in tech sector*, <https://legno.com/2012/06/28/black-founders-of-internet-domain-registry-network-solutions-reminisce-on-racial-barriers-in-tech-sector/>; Gina Henderson, "debauch.com", *Emerge*, p. 136, May, 2000.



protection of IP rights should not be solely the responsibility of individual rightsholders, but also an affirmative obligation of the federal government. Through similar legislation, Congress could authorize the appointment of a Coordinator to "Promote American Innovative and Creative Enterprise". Unleashing our nation's full IP potential is as vital to the national interest as the enforcement of IP protection. A "PAICE" coordinator could utilize the data provided by the suggested Congressional commission to implement its recommendations, actively solicit the cooperation of other government agencies and the participation and support of the private and non-profit public sectors, and otherwise construct and pursue a strategic plan for enhancing the public's participation in the IP ecosystem.²

Finally, specific attention should be focused on the impacts of online environments and venues for non-traditional IP production and commercialization. Unhampered by many of the traditional gatekeeper barriers to widespread and equitable participation in the IP regime, social media and other digital venues have proven fertile ground for the successful production, use, and entrepreneurial exploitation of IP by many non-traditional creatives and innovators. This demonstrated success affirms that the benefits of IP engagement can be accessible to and empowering for all Americans.

Enumerated Responses to Specific Questions for the Record

**Questions for the Record of Senator Patrick Leahy
Chair, Intellectual Property Subcommittee**

Hearing on: "Improving Access and Inclusivity in the Patent System: Unleashing America's Economic Engine"

- I. **Would you support cultivating a diverse group of patent and trademark examiners by holding job fairs at Historically Black Colleges and Universities, Tribal Colleges, and universities and institutions that serve large Hispanic populations? What other methods would you suggest for identifying and recruiting a more diverse group of patent and trademark examiners?**

The cultivation of a diverse group of patent and trademark examiners to develop and conduct job fairs at Historically Black Colleges and Universities, Tribal Colleges, and universities and institutions that serve large Hispanic populations would be an extremely effective means by which to identify and recruit a more diverse population of patent and trademark examiners. While many students from diverse backgrounds today pursue a variety of STEAM degrees toward careers in IP *production*, many of these students are wholly unaware of the career opportunities available in the related fields of IP *protection and commercialization*. Diversity Jobs Fairs conducted by a diverse group of patent and trademark examiners would not only apprise such students of these career options but would also reassure them that these career paths are actually open to students from diverse backgrounds. Diversity Job Fairs could also be effectively conducted at majority institutions, when organized in collaboration with resident student cultural organizations, which are often a key conduit to minority students attending such schools.

² Moreover, the responsibilities of a "PAICE" coordinator would not be limited to increasing the participation of only socially marginalized groups, but would extend to improving the participation of *all* IP-underserved communities and geographic regions in the nation.



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The reach of the Diversity Job Fairs could be expanded by also conducting them in collaboration with IP professional organizations within underserved communities, such as the National Society of Black Engineers and the Black Entertainment and Sports Law Association, as well as in conjunction with other trusted community institutions, such as local 4-H Clubs and civil rights organization branch offices. Further, an adjunct program of online IP career awareness and training webinars, publicized through social media and targeting working graduates and professionals, will enable these and other Diversity Job Fair participants to prepare for the patent and trademark examiner application process and ultimate success in these positions.³

**Senator Tillis Questions for the Record – Improving Access and Inclusivity in the Patent System:
Unleashing America’s Economic Engine**

- 1. Assuming the USPTO were to collect demographic data, are there ways that the USPTO can establish a lack of bias, or otherwise address the issue, when it asks applicants to voluntarily submit application data?**

Perhaps the most effective means through which the USPTO can reassure applicants that demographic information will be used only to promote more inclusive participation in the innovation ecosystem and otherwise enhance the Office’s function in serving the public, would be to partner with an unaffiliated non-profit IP NGO to collect such information. It would be critical that any such entity not only enjoy credibility with underserved communities but also possess expertise in IP law and policy. One reason that many IP-underserved communities continue to face challenges in gaining full and beneficial access to the IP ecosystem is that few of their trusted community institutions and activist organizations have experience with IP law and policy, and consequently these institutions and organizations are unfamiliar with the information and skill sets needed to interface effectively with the IP regime. An appropriately qualified non-profit IP NGO could be particularly effective if it collected applicant demographic information in collaboration with one or more HBCUs and similar institutions. HBCUs enjoy a high reputation for community service, and many of the target communities would trust demographic data collection undertaken under their aegis.

- 2. What additional data points related to the innovation ecosystem would be useful to help researchers? What agencies or other organizations could contribute to collecting such data?**

Data regarding IP entrepreneurship and start-ups in underserved communities, as well as data regarding the extent to which such small and medium businesses pursue IP protection and valuation, as compiled by the Small Business Administration would be useful. Additional information could be obtained from minority and rural solo IP practitioners and small law firms, as they traditionally serve the IP needs of these IP producers and users, and have firsthand knowledge of the challenges they face.

³ In recent years, a number of private and non-profit NGO actors have offered various no-cost programs of this kind, complementing some similar initiatives by the USPTO. See e.g., Finnegan IP University, <https://www.finnegan.com/en/Finnegan-IP-University.html>; Take Creative Control, <https://takecreativecontrol.org/about-take-creative-control/>. Currently, these programs are largely decentralized, and availability is uneven throughout the nation. A “PAICE” coordinator could collaborate with a non-profit IP NGO serving IP-underserved communities to research and compile a database of these programs and thereby coordinate a national, no-cost public IP education and training curriculum. In addition, the NGO could further serve as a co-resource for information and updates regarding Diversity Job Fair events, training programs, and application deadlines.



Minority IP trade and professional organizations such as NSBE and BESLA can also provide information regarding artist and innovator perception of and engagement with the IP ecosystem.

A study evaluating the extent to which social media and digital business environments have provided new and resilient avenues for IP commercial enterprise by marginalized community creatives, innovators, and entrepreneurs would also be instructive. As referenced above, limited studies and anecdotal evidence indicates that members of marginalized and underserved communities have disproportionately turned to social media and the digital commercial marketplace to develop, disseminate, and exploit their IP, and information regarding their experiences and successes would be helpful towards building upon these advances.

3. What recommendations do you have to increase the participation of marginalized and underrepresented groups in the patent system?

The data and information compilation referenced above could be used to create a series of IP awareness and education Public Service Announcements, through which various entertainment celebrities, social media influencers, and digital entrepreneurs, as well as other IP "public figures" such as Neil DeGrasse Tyson, Patricia Bath, Hakeem Oluseyi, Ayla Hutchinson and others could promote engagement in the IP ecosystem. As discussed above, a series of online IP education and training webinars targeting underserved communities would also be effective. In addition, in-community live events could be organized in collaboration with non-profit IP organizations and with support from the private sector. Such events would not only educate the public about IP law and current developments, but they could also provide venues in which to showcase local talent and IP achievements and entrepreneurial success, and with private sector participation, could also provide "IP talent scout" opportunities.

4. What does success look like to you in terms of improving access and inclusion in the innovation ecosystem and what steps will it take to get there?

A successful national strategy for improving access and inclusion in the innovation ecosystem would embody an "inspiration to commercialization pipeline" that replicates the development and recruitment of athletic talent in America. Throughout marginalized and mainstream communities, American athletes are nurtured and trained as early as grade school age and in both educational and community programs and venues. Potential athletes are presented with clear paths toward professional development and exploitation of their talents, notwithstanding the statistically limited opportunities for professional careers. While American students are encouraged to develop their STEAM capabilities and talents and to pursue pertinent professional careers, the opportunities for related careers in IP protection, such as patent agents and IP legal practice, as well as the benefits of IP commercialization, are rarely explored even at the collegiate or post-graduate level. Through age-appropriate K-12 as well as higher education programs, potential innovators would be exposed to IP principles in curricular, extra-curricular, and community programs which explain the intersections between STEAM achievement and IP production and commercialization. An effective "inspiration to commercialization pipeline" would accordingly begin with early-age through collegiate IP education, continue with public adult IP education and training, and culminate in preliminary and need-based public, private, and academic clinic IP pro bono counseling toward IP protection and commercialization.



5. What initiatives in this area have been particularly successful, in your perspective?

The most successful initiatives have included direct innovator and creative outreach and education through in-community/in-person events, comprised of information presentations, panel conversations, and pro-bono legal counseling, all in partnership with commercial IP purveyors, private law firms, NGOs, and academic institutions. In addition to "IP fundamentals", such events include discussions of innovator/creator-informed and innovator/creator-driven policy agenda. Underserved innovators and creators are most receptive to IP education which places law and policy requisites in the context of policy solutions designed to empower them through IP endeavor, and to enable them to advocate for socio-economic change.

6. Where do you think main obstacles are towards achieving this goal? How do you recommend addressing the issue?

As discussed above, lack of knowledge of the IP regime and historic mistrust of IP industries present the most significant obstacles to enhancing the public participation in the IP ecosystem, particularly with respect to systemically marginalized groups and underserved communities. The construction and implementation of an affirmative national strategy to promote American innovative and creative enterprise, based upon an expert study of the industry practices and public perceptions which have contributed to limited and inequitable participation by various cohorts, would galvanize public engagement in IP endeavor.

Respectfully Submitted,
Lateef Mtima
Professor of Law

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inventtogether.org

Statement of

**Holly Fechner
Executive Director
Invent Together**

**For the
Subcommittee on Intellectual Property
Committee on the Judiciary
U.S. Senate**

**Hearing on
Improving Access and Inclusivity in the Patent System:
Unleashing America's Economic Engine**

April 21, 2021



Invent Together appreciates the opportunity to submit a statement for the record for the Senate Judiciary Subcommittee on Intellectual Property (“the Subcommittee”) hearing on “Improving Access and Inclusivity in the Patent System: Unleashing America’s Economic Engine.”

Invent Together is an initiative supported by organizations, universities, companies, and other stakeholders dedicated to understanding the gender, race, income, and other diversity gaps in invention and patenting and supporting public policy and private efforts to close them. Over the past five years, Invent Together has convened workshops with researchers and practitioners, supported the SUCCESS Act and the IDEA Act, and participated in the National Council for Expanding American Innovation. In fall 2020, Invent Together launched a public website—www.inventtogether.org—to provide a new platform and additional tools for educating and informing stakeholders about diversity in invention and patenting and related public policy efforts.

Thanks to brilliant inventors, engineers, entrepreneurs, scientists, and creators, the United States is an innovation powerhouse. When we expand who invents and patents, we create jobs, grow businesses, increase the gross domestic product (GDP), close wage and wealth gaps, and improve our position as a global leader in innovation. We will also benefit from the creation of new and different inventions.

Expanding participation in invention and patenting—and building a strong economy—will require businesses, academia, and government to each do their part to embrace American diversity and ingenuity. The solutions will need to address challenges faced by independent inventors, as well as inventors who work at companies and universities.

PATENT GAPS

Intellectual property (IP) is critical to the U.S. economy. The USPTO has estimated that IP-intensive industries generate over \$8 trillion—more than one-third of U.S. GDP—and support 45.5 million jobs—more than one-third of U.S. employment.

Despite the enormous significance of IP to both the economy and to individual inventors, not all Americans share equally in the opportunity to invent and patent. The USPTO and leading researchers have found that women, people of color, and lower-income individuals patent inventions at significantly lower rates than their representation in the population:

- Less than 13 percent of all inventors who hold a U.S. patent are women.¹ Women hold only 5.5 percent of commercialized patents.²
- Inventing activity by Black inventors peaked in 1899 and has not recovered.³ Black and Hispanic college graduates patent at half the rate of White college graduates.⁴
- Children in families in the top one percent of income are ten times more likely to patent as adults than children in the entire bottom half of family income.⁵

These disparities impair economic growth and U.S. leadership in innovation and deny individual members of underrepresented groups the benefits and opportunities that patent ownership creates.

Closing these gaps would have significant benefits for individuals and society as a whole. Increasing participation in invention and patenting by underrepresented groups would quadruple the number of American inventors⁶ and increase annual U.S. GDP by almost \$1 trillion.⁷ Research also shows that inventors with patents consistently earn higher incomes on average than inventors without patents, controlling for occupation, migrant status, and other factors. Patents also help businesses—especially small businesses and startups owned by women and people of color—access capital, attract customers and licensees, and create jobs. For example, startups that obtain a patent employ an average of sixteen more new employees after five years, compared to startups that do not obtain a patent.⁸ Startups with patents also have a higher likelihood of obtaining venture capital funding and loan financing, which attract additional investment and help grow businesses and create jobs.

COMMON BARRIERS

Women, people of color, and other underrepresented groups face numerous barriers to equitable participation in the patenting of inventions, including a lack of exposure to innovation, access to invention education, mentorship opportunities, and capital, as well as entrenched cultural issues, such as discrimination and unconscious bias.

- **Exposure:** Lack of exposure to inventors inhibits invention and patenting. According to a study by Harvard researchers, “Children who grow up in areas with more inventors—and are thereby more exposed to innovation while growing up—are much more likely to become inventors themselves.”⁹ Indeed, children whose parents are inventors are nine times more likely to become inventors,¹⁰ and “children who grow up in a neighborhood or family with a high innovation rate in a specific technology class are more likely to patent in *exactly the same* class.”¹¹ Children who attend research universities also tend to patent at similar rates, suggesting “that factors that affect children before they enter the labor market, such as childhood environment and exposure to innovation, drive much of the gaps in innovation.”¹²
- **Education:**
 - Access to high-quality invention education is critical to help people develop the mindset necessary to become inventors. Invention education “is a term that refers to deliberate efforts to teach people how to approach problem finding and problem solving in ways that reflect the processes and practices employed by accomplished inventors.”¹³ While STEM education helps students develop technical skills, invention education helps students develop problem-identification and problem-solving skills, as well as an invention mindset.
 - Invention education can also help children uninterested in STEM disciplines see the value of STEM skills.¹⁴ Invention education draws on multiple disciplines, including but not limited to STEM, and students’ lived experiences.¹⁵ Many students lack access to invention education because “[f]ederal education standards in K–12 continue to emphasize instruction that maintains disciplinary silos. School finance mechanisms, K–12 accountability standards, and college entrance

- requirements reinforce the siloed, linear approach to teaching and learning found in today's schools" and make it difficult to implement invention education.¹⁶
- Access to STEM education is also important for developing technical skills and interest in patent-intensive fields. In light of evidence that children who are not exposed to STEM before middle school are less likely to pursue STEM careers, STEM education in primary and secondary schools can play an important role in inspiring diverse students to pursue these fields.¹⁷
 - It is important to note that disparities in STEM education are only part of the reason for the patent gaps. From 1977 to 2010, the percentage of STEM degrees awarded to women increased from 20.2 percent to 33.5 percent.¹⁸ Yet this increase in STEM-educated women has not led to greater equity in patenting. According to the Institute for Women's Policy Research (IWPR), "[W]omen's representation in key patent-intensive STEM fields (such as engineering) may play an even larger role than women's representation in STEM overall."¹⁹ Thus, even as women earn a higher share of STEM-related degrees, it is critical to continue encouraging members of underrepresented groups to pursue careers in patent-intensive fields.
- **Social Networks and Mentorship:** Social networks and mentorship play significant roles in encouraging patenting. Social networks are key to helping inventors "evaluat[e] whether it would be worthwhile to pursue a patent" in the first place since an inventor is likely to first seek advice from his or her own peers.²⁰ Moreover, the relative "exclusion from STEM fields" of women, people of color, and other underrepresented groups has led to limited available mentorship opportunities and networks.²¹ Because inventors tend to seek mentors who share similar backgrounds, and there are fewer women and people of color in positions to act as mentors for inventors, it is harder for underrepresented inventors to find inventors to mentor them.²²
 - **Capital:** According to estimates, female founders receive only 1 percent of all venture capital (VC) funding, and Black founders receive less than 2 percent.²³ This massive funding gap penalizes women inventors and inventors of color, who are less likely to receive venture backing for their ideas than their White, male counterparts. Funding helps inventors research and develop their ideas, and eventually bring them to market. Patents are also important assets for attracting investment capital in potential businesses. Disparities in patent rates, therefore, lead to disparities in investment rates, and vice versa.
 - **Workplace Culture:** Discrimination against women, people of color, and other underrepresented groups in the workplace, cultural inertia in academia and industry, and unconscious bias from gender and racial stereotypes all contribute to the patent gaps.

INSTITUTIONAL SOLUTIONS

Overcoming the barriers to participation in invention and patenting requires conscious effort and institutional change by universities, companies, and other organizations that support inventors. We recommend the following best practices:

- ***Foster Organizational Cultures that Value Diversity, Invention, and Patenting***
 - Organizations should take steps to build pro-patent and pro-diversity initiatives into their cultures. This includes efforts to educate employees about the importance of patenting and how to seek patent protections for their work; to recruit and retain a more diverse pool of creators, scientists and engineers; and to support formal and informal networks for diverse inventors.
 - Universities should work to promote a culture of innovation across their institutions, beyond technology transfer offices. From university leadership to department chairs, active support for inventing and patenting activities—including factoring patenting activity into tenure and promotion decisions—would encourage diverse faculty to patent. AUTM has developed a Women Inventors Toolkit to assist universities with implementing programs designed to help women faculty members disclose, protect, and commercialize their research.²⁴ The AUTM Women Inventors Toolkit provides practical tips on how to gain support for such programs within a university and how to fund and design events.²⁵
 - Companies with employees who invent should adopt the Intellectual Property Owners Association (IPO) Toolkit, which details a four-step process that empowers businesses to raise awareness about the importance of diversity in patenting, identify and evaluate root causes of patent gaps, develop programs that close the patent gaps, and monitor and assess the success of those programs.²⁶
- ***Promote Invention and STEM Education and Increase Exposure to Innovation***
 - Companies and organizations should provide opportunities for students of all backgrounds to participate in invention and STEM education programs. Examples of successful company and non-profit invention education programs include Qualcomm’s Thinkabit Lab and the Lemelson Center for the Study of Invention’s Spark!Lab.²⁷ Thinkabit Labs operate in sixteen sites across five states,²⁸ and there are nine Spark!Labs throughout the country.²⁹ Both programs break down the invention process, teach students to build their own inventions, and expose students to inventors.
 - Colleges and universities should promote greater gender, race, and income diversity in the most patent-intensive STEM fields in colleges and graduate schools, such as computer science, mechanical engineering, and electrical engineering.

- ***Provide Commercialization Support to Diverse Inventors***
 - Technology transfer offices at universities should ensure that diverse university researchers have the institutional support to bring their inventions to market. Underrepresented groups often lack access to the resources and expertise to support the commercialization process, and absent robust networks with industry, it can be difficult for individual inventors and entrepreneurs to attract investors for their businesses. For women and people of color, whose access to social networks is more limited, technology transfer offices can prove especially valuable to help navigate the patenting process and grow their networks.³⁰ Technology transfer offices are also critical to helping university researchers patent their inventions, identify corporate partners for academic research projects, and incubate startups.³¹
 - Companies should help diverse employees commercialize their ideas by providing education and training on invention disclosure and patent review processes; implementing formal mentorship programs; encouraging collaboration among employees; and ensuring that work is delegated fairly so all employees have the opportunity to invent and patent.
 - VC firms should fund underrepresented entrepreneurs. Some venture funds already focus on investing in diverse founders.

PUBLIC POLICY SOLUTIONS

Improving access and inclusivity in the U.S. patent system will also require action by Congress and the Administration. We recommend the following steps:

- ***Pass the IDEA Act***
 - Invent Together supports the Inventor Diversity for Economic Advancement (IDEA) Act, a bipartisan, bicameral bill that would direct the USPTO to collect demographic data—including on gender, race, and veteran status—on inventors from patent applicants on a voluntary basis, and make this information available to the public.³² The bill would require the USPTO to keep this information separate from the patent application to mitigate implicit bias in the patent examination process.
 - The USPTO currently collects no data on race, gender, or income from patent applicants, requiring researchers to use name-matching software and other techniques to study disparities in patenting. Reliable studies of both the patent gaps and their remedies require a current and comprehensive data source that the USPTO can create and publish to maintain accountability for equity in patenting.
 - Having complete and accurate information on the demographics of inventors is a critical step in measuring national progress toward realizing greater diversity and inclusion in invention and patenting. Without information, Congress, the USPTO, and the public have no reliable way to understand the nature and scope of the

patent gaps, and no basis to measure the impact of public and private initiatives to close them.

- ***Implement SUCCESS Act Report Recommendations***
 - Invent Together supports the SUCCESS Act report recommendation to conduct a voluntary, confidential, biennial survey of individuals named in patent applications that have been filed with the USPTO to gather demographic data.³³ Separate from the IDEA Act, conducting a survey would allow the USPTO to gain additional insight into the characteristics of inventors who have applied for U.S. patents.
 - Invent Together supports the SUCCESS Act report recommendation to make it easier for federal agencies to share data with the USPTO to facilitate the study of patent gaps.³⁴ This includes ensuring that the Office of Management and Budget (OMB) designate the USPTO a data-sharing agency under the Confidential Information Protection and Statistical Efficiency Act (CIPSEA).
- ***Gather and Share Information About Patent Diversity***
 - The Council of Economic Advisers (CEA) should study and report the patent gaps for people of color, women, and other underrepresented groups, and quantify the positive impact that greater access to inventing and patenting would have on individual income, wage gaps, national GDP, and U.S. technology leadership.
 - The Federal Reserve should study and report the positive impact that expanding the number of inventors of color and patents granted to inventors of color would have on racial economic gaps and U.S. economic growth and recovery in the wake of the ongoing coronavirus pandemic, which has presented financial challenges for millions of Americans and exacerbated existing economic disparities.
 - Congress should work with the Administration to conduct a public awareness campaign that features diverse inventors with compelling stories and utilizes the Internet, social media, and television/streaming to educate Americans about the importance of inventing and patenting and the resources available to them.
- ***Improve Programs and Resources for Small Businesses***
 - Congress should work with the Administration to improve the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs to help ensure innovation funding is allocated equitably and projects are commercialized.
 - Programmatic improvements should include increasing the diversity of application reviewer pools, conducting blind reviews of scientific and technical merit sections of applications, adding review of commercialization potential, studying the application and appeals processes for potential biases and barriers to participation, and developing outreach and education initiatives focused on underrepresented populations.

- First-time and underrepresented SBIR/STTR program applicants at all participating agencies should receive “Phase 0” assistance similar to the support offered by the Department of Energy.
 - SBIR/STTR awardees should receive assistance with commercializing their projects. Congress should pass, and the President should sign, the bipartisan, bicameral Research Advancing to Market Production (RAMP) for Innovators Act.³⁵ The RAMP for Innovators Act would require each participating agency to designate a Technology Commercialization Official to help awardees commercialize their projects and to conduct an annual commercialization impact assessment. It would also improve the flexibility of technical and business assistance, which may be used for IP protection, and require the SBA and USPTO to enter into an interagency agreement to help awardees with IP protection.
 - Congress and the Administration should ensure that the SBA and Small Business Development Centers (SBDCs) coordinate with USPTO programs at the local level to train small businesses on IP protection so that diverse small business owners have access to the information and support they need to pursue patents. A 2020 Government Accountability Office (GAO) report found that only two of twelve SBDCs interviewed worked with the USPTO to help small businesses protect their IP, even though the Small Business Innovation Protection Act of 2017 requires that SBDCs provide IP training in coordination with the USPTO.³⁶
 - Women’s Business Centers and Minority Business Development Agency Business Centers should coordinate with USPTO programs at the local level to train women and inventors of color on IP protection.
 - Existing technical resources for diverse inventors and business owners, including the SBA Learning Center, Business Guide, and Emerging Leaders curriculum, should incorporate invention and patent education.
- ***Invest in Research and Development and Support Technology Transfer Offices***
 - Congress should provide greater funding opportunities for diverse inventors, including by expanding existing research and development programs, such as the SBIR and STTR programs, and creating new grant programs.
 - Congress should pass, and the President should sign, the bipartisan, bicameral Endless Frontier Act, which would authorize substantial funds to advance research and innovation in key technology areas in the United States, including grants for universities and partners to establish technology centers, test beds, and lab-to-market programs; and for universities to provide scholarships and fellowships. The legislation would also authorize funds for consortia to create regional technology hubs. This effort would not only help diverse inventors overcome barriers, but also help the United States remain a global leader in technology development.
 - Congress should also work with the Administration to provide funding and resources to support and stand up technology transfer offices. Certain colleges

and universities, including a number of minority-serving institutions, have no or under-resourced technology transfer offices.

- ***Invest in Invention Education and Innovation Exposure***
 - Congress should ensure schools, including community and technical colleges, teach high-quality invention education. Research suggests that project-based and multi-year experiences are the most effective approaches to invention education.³⁷ It is also critical that educators are “provided with resources to assist with the design and implementation of invention education offerings including the spaces needed to design and build, materials and equipment, online resources, and time within an already tight school schedule.”³⁸
 - It is important that young Americans from all demographic groups hear stories about inventors who look like them. As Marian Wright Edelman once said, “You can’t be what you can’t see.” Incorporating innovation exposure into school curricula, math and science camps, and other youth programs is critical to inspiring young people to become inventors later in life. Experts report that “[t]argeting exposure programs to children from underrepresented groups who excel in math and science at early ages is likely to maximize their impacts.”³⁹
- ***Promote Workplace Fairness***
 - Nondiscrimination laws should be fully enforced, and women and people of color should receive equal pay for equal work. Affordable child care, paid family and medical leave, and paid sick days are also essential to ensuring that everyone can contribute to the innovation economy.
- ***Lower the Costs of Patenting***
 - Congress should work with the USPTO to lower the high costs associated with patenting that create barriers to entry. High fees associated with filing and defending a patent can pose a substantial barrier because people from underrepresented groups earn less, on average. Attorney fees alone for filing a patent application can cost \$5,000 to \$16,000 by some estimates,⁴⁰ excluding other associated costs.
 - Programs like the USPTO Pro Bono Assistance Program, which matches qualified low-income applicants with volunteer patent attorneys who practice at private firms or in solo practices, and the USPTO Pro Se Assistance Program, which provides advice to inventors who wish to pursue patents without the help of an attorney, can help mitigate the high costs of patenting an invention, but they could be expanded to help those for whom attorneys’ fees are a major barrier to entry.
 - The USPTO should also continue to expand its Law School Clinic Certification Program. Today, students at more than 60 participating law schools provide pro bono assistance to independent inventors seeking patent advice under the supervision of their law school clinical faculty.⁴¹

- *Update Patent Bar Examination Criteria*
 - Invent Together supports near-term reform and regular review of the patent bar examination requirements to ensure they do not exclude qualified individuals from membership in the patent bar.
 - Several recent papers argue that the criteria the USPTO has set for registration for the examination exclude qualified women and other individuals from membership in the patent bar.⁴² Only candidates with certain scientific and technical qualifications may sit for the exam. These criteria allow individuals with degrees in engineering and physical sciences to sit for the exam, but not other majors more common among women, such as mathematics, industrial and fashion design. In addition, individuals with undergraduate degrees in certain majors automatically qualify for the exam, but those with master's degrees or doctorate degrees in the same subjects do not.
 - Three Members of this Subcommittee—Senators Mazie Hirono, Thom Tillis, and Chris Coons—recently wrote to the USPTO regarding this issue.⁴³
 - During his last few days as USPTO Director, Andrei Iancu responded to the Senators' letter.⁴⁴ Iancu wrote that the USPTO is exploring changes to the patent bar requirements, to ensure they are up to date and do not discourage applications from women or other underrepresented groups.⁴⁵

* * *

Thank you for the opportunity to submit this statement. Invent Together looks forward to continuing to work with the Subcommittee to improve access and inclusivity in the patent system.

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- ² Jennifer Hunt et al., *Why Don't Women Patent* 1 (Nat'l Bureau of Econ. Research, Working Paper No. 17888, 2012), <https://www.nber.org/papers/w17888>.
- ³ Lisa D. Cook, *Violence and Economic Growth: Evidence from African American Patents, 1870 to 1940*, (Oct. 2013), https://lisadcook.net/wp-content/uploads/2014/02/pats_paper17_1013_final_web.pdf.
- ⁴ INSTITUTE FOR WOMEN'S POLICY RESEARCH (IWPR), EQUITY IN INNOVATION: WOMEN INVENTORS AND PATENTS 5-6 (2016) ("EQUITY IN INNOVATION"), <https://iwpr.org/wp-content/uploads/2020/12/C448-Equity-in-Innovation.pdf>.
- ⁵ Alex Bell et al., *Who Becomes an Inventor in America? The Importance of Exposure to Innovation* ("Who Becomes an Inventor in America?") 2 (Nov. 2018), http://www.equality-of-opportunity.org/assets/documents/inventors_paper.pdf.
- ⁶ See Alex Bell et al., *Who Becomes an Inventor in America?*, at 34.
- ⁷ See Lisa D. Cook, *Economic and Social Implications of Racial Disparities* (Jun. 8, 2020), <https://bcf.princeton.edu/wp-content/uploads/2020/11/Combined-Slides-10.pdf>.
- ⁸ Joan Farre-Mensa et al., *What is a Patent Worth? Evidence from the U.S. Patent "Lottery"* 3 (Nat'l Bureau of Econ. Research, Working Paper No. 23268, 2018), https://www.nber.org/system/files/working_papers/w23268/w23268.pdf.
- ⁹ ALEX BELL, COMMENTS BEFORE THE USPTO, SUCCESS ACT HEARINGS 7 (2019).
- ¹⁰ See Alex Bell et al., *Who Becomes an Inventor in America?*, at 17-18.
- ¹¹ *Id.* at 1.
- ¹² ALEX BELL, COMMENTS BEFORE THE USPTO, SUCCESS ACT HEARINGS, at 8.
- ¹³ STEPHANIE COUCH ET AL., RESEARCHING INVENTION EDUCATION: A WHITE PAPER ("RESEARCHING INVENTION EDUCATION") 1 (2019).
- ¹⁴ 3 *Questions: Stephanie Couch on Invention and Inspiring Young People to Pursue STEM Education*, MIT NEWS, <https://news.mit.edu/2016/stephanie-couch-inspiring-young-people-to-pursue-stem-education-0601> (last visited Apr. 20, 2021).
- ¹⁵ See STEPHANIE COUCH ET AL., RESEARCHING INVENTION EDUCATION, at 2.
- ¹⁶ See *id.* at 57.
- ¹⁷ See Talia Milgrom-Elcott, *STEM Starts Earlier Than You Think*, FORBES (Jul. 24, 2018), <https://www.forbes.com/sites/taliamilgromelcott/2018/07/24/stem-starts-earlier-than-you-think/#1fbc0938348b>.
- ¹⁸ IWPR, EQUITY IN INNOVATION, at 8.
- ¹⁹ *Id.* at 8.
- ²⁰ *Id.* at 22.
- ²¹ See *id.* at 23.
- ²² See *id.* at 22.
- ²³ See, e.g., Emma Hinchliffe, *Female Founders' Share of Venture Capital Funding Shrank to 2.2% in 2020*, FORTUNE (Feb. 8, 2021), <https://fortune.com/2021/02/08/female-founders-venture-capital-funding-2020/>; James Norman, *A VC's Guide to Investing in Black Founders*, HARV. BUS. REV. (Jun. 19, 2020), <https://hbr.org/2020/06/a-vcs-guide-to-investing-in-black-founders>.
- ²⁴ AUTM, WOMEN INVENTORS TOOLKIT, <https://autm.net/AUTM/media/Surveys-Tools/Documents/WIC-TOOLKIT-1118.pdf>.
- ²⁵ See *id.*
- ²⁶ INTELLECTUAL PROPERTY OWNERS ASSOCIATION, GENDER DIVERSITY TOOLKIT (2019), <https://ipo.org/wp-content/uploads/2019/09/GenderDiversitytoolkit-final.pdf>.
- ²⁷ See generally Program, QUALCOMM THINKBIT LAB, <https://thinkbitlab.com/thinkbit-lab#program> (last visited Apr. 20, 2021); About Spark/Lab, LEMELSON CENTER FOR THE STUDY OF INVENTION AND INNOVATION, <https://invention.si.edu/about-sparklab> (last visited Apr. 20, 2021).
- ²⁸ Impact, QUALCOMM THINKBIT LAB, <https://thinkbitlab.com/impact> (last visited Apr. 20, 2021).

²⁹ *Spark/Lab Network*, LEMELSON CENTER FOR THE STUDY OF INVENTION AND INNOVATION, <https://invention.si.edu/sparklab-network> (last visited Apr. 20, 2021).

³⁰ Waverly Ding et al., *Gender Differences in Patenting in the Academic Life Sciences*, SCIENCE, Aug. 4, 2006, at 665-67.

³¹ See *What is Tech Transfer*, AUTM, <https://autm.net/about-tech-transfer/what-is-tech-transfer> (last visited Apr. 20, 2021).

³² S. 632/H.R. 1723, 117th Cong. (2021).

³³ USPTO, REPORT TO CONGRESS PURSUANT TO P.L. 115-273, THE SUCCESS ACT 26 (2019).

³⁴ *Id.*

³⁵ S. 2127/H.R. 3839, 116th Cong. (2019); see also H.R. 652, 117th Cong. (2021).

³⁶ U.S. GOV'T ACCOUNTABILITY OFF., GAO-20-556, INTELLECTUAL PROPERTY: ADDITIONAL AGENCY ACTIONS CAN IMPROVE ASSISTANCE TO SMALL BUSINESSES AND INVENTORS (2020), <https://www.gao.gov/assets/710/709024.pdf>.

³⁷ Stephanie Couch et al., *Addressing The Gender Gap Among Patent Holders Through Invention Education Policies*, 19 TECH. AND INNOVATION 735, 747 (2018).

³⁸ See STEPHANIE COUCH ET AL., RESEARCHING INVENTION EDUCATION, at 52.

³⁹ ALEN BELL, COMMENTS BEFORE THE USPTO, SUCCESS ACT HEARINGS, at 5.

⁴⁰ Gene Quinn, *The Cost of Obtaining a Patent in the U.S.*, IPWATCHDOG (Apr. 4, 2015), <http://www.ipwatchdog.com/2015/04/04/the-cost-of-obtaining-a-patent-in-the-us/id=56485/>.

⁴¹ See *USPTO Adds Additional Schools to Law School Clinic Certification Program*, USPTO (Jun. 20, 2018), <https://www.uspto.gov/about-us/news-updates/uspto-adds-additional-schools-law-school-clinic-certification-program>.

⁴² See, e.g., Mary T. Hammon, *The Patent Bar Gender Gap: Expanding the Eligibility Requirements to Foster Inclusion and Innovation in the U.S. Patent System*, 10 I.P. THEORY 1, at 2 (2020), <https://www.repository.law.indiana.edu/ip/vol10/iss1/1>.

⁴³ Letter from Mazie Hirono, Thom Tillis, and Chris Coons, U.S. Senators, U.S. Senate, to Andrei Iancu, Under Sec'y of Commerce for Intellectual Prop. & Dir. of the USPTO (Dec. 11, 2020), <https://www.ipwatchdog.com/wp-content/uploads/2020/12/2020.12.11-Letter-to-PTO-re-Patent-Bar-Gender-Gap.pdf>.

⁴⁴ Letter from Andrei Iancu, Under Sec'y of Commerce for Intellectual Prop. & Dir. of the USPTO, to Thom Tillis, Mazie Hirono, and Chris Coons, U.S. Senators, U.S. Senate (Jan. 19, 2020), <https://www.ipwatchdog.com/wp-content/uploads/2021/01/USPTO-response-to-Sens.-Hirono-Tillis-Coons-letter-01192021-1-2.pdf>.

⁴⁵ See *id.*

Appendix A



Engine

ENGINE'S RESPONSE
to the Call for Comments on
EXPANDING AMERICAN
INNOVATION





Before the
U.S. Patent and Trademark Office

In the Matter of
**Request for Comments on the National Strategy
for Expanding American Innovation**

Docket Number PTO-P-2020-0057

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TABLE OF CONTENTS

Introduction.....	1
Importance of Diversity.....	3
Patenting.....	5
Stark disparities in patent ownership exist.....	5
Making the patent system more inclusive.....	6
Access to Capital.....	8
Underrepresented founders face serious barriers across every traditional funding stream	8
Leveraging the government in expanding capital access across the board.....	12
Networking & Mentoring	17
Community is critical for startup success, and underrepresented founders often lack access.....	17
Facilitating and funding networking and mentoring programs for underrepresented founders	19
Education & Training.....	22
Diversity gaps among students and educators.....	22
Funding STEM and I&E education initiatives for underrepresented students and educators.....	25
Conclusion.....	27



INTRODUCTION

Engine is a non-profit technology policy, research, and advocacy organization that bridges the gap between policymakers and startups. Engine works with government and a community of thousands of high-technology, growth-oriented startups across the nation to support the development of technology entrepreneurship through economic research, policy analysis, and advocacy on local and national issues. Engine appreciates the opportunity to submit this response to the U.S. Patent and Trademark Office's (USPTO) request for comment on expanding the country's innovation ecosystems to be more diverse and inclusive.¹

The National Council for Expanding American Innovation's (NCEAI) work will touch on critical challenges and opportunities facing the nation's innovation ecosystems. Engine encourages NCEAI to seek a complete picture of the barriers underrepresented innovators and entrepreneurs routinely yet unfairly face, and Engine urges the entire federal government to mobilize toward increasing diversity and inclusion in innovation.

It would be difficult to overstate the value of diversity to innovation and entrepreneurship. Diverse teams generate better economic results, and more—often better—innovation emerges from their unique perspectives. In addition, as the nation continues the essential work of seeking to rectify systemic inequality and structural racism, increasing diversity in innovation should be a core component. Startups make outsized contributions to economic and job growth, and those benefits cannot continue to be withheld from historically underserved communities.

Looking first to the patent system, NCEAI and USPTO must recognize that the agency's stakeholders extend far beyond patent applicants and owners. And in seeking to promote diversity in innovation, the USPTO should not only keep

startups in mind—the USPTO should also look to customers and users who never intend to interact with the patent system because they still have a stake when the government grants exclusive rights in certain technologies. To promote diversity, Engine encourages the USPTO to build or expand initiatives that equip underrepresented founders who want patents with the tools or resources they need to obtain high-quality ones. It should also find ways to eliminate bias in the application process and collect better data to monitor progress.

Outside the patent system, there is much more the government should do to foster diverse and inclusive innovation. The most significant challenge facing many startups is accessing capital. Venture capital (VC) and equity investment is imbalanced along race, gender, ethnic, and geographic lines. Most VC funding goes to companies founded by white men located in a few corners of the U.S. Many underrepresented founders are further excluded because they lack equitable access to more common sources of startup capital—personal or family wealth and lines of credit or business loans. Systemic racism and sexism have created deep gaps in wages and wealth, leaving many underserved founders at an unwarranted (and sometimes severe) disadvantage.

There are many levers the government can pull, starting with its own funding. Agencies should seek to eliminate current bias and disparities in federal grants and loans. To accomplish this they should, for example, ensure diverse leaders are at the table, setting more inclusive research priorities and making funding decisions. The government should also create or improve existing financial programs to better serve startups—particularly nascent tech companies, which have different needs, and would benefit from specific tax credits or streamlined grant review. In addition, the government should consider how it can encourage private investors to spend in more equitable ways, like by incentivizing angel investors or implementing policies to reduce bias in banking.

¹ Request for Comments on the National Strategy for Expanding American Innovation, 85 Fed. Reg. 83906 (Dec. 23, 2020).





Another core feature of startup success is rooted in networking and mentoring. Startups across the country routinely emphasize the enormous value of community. Yet this is another area where underrepresented founders have been historically excluded—costing them access to potential investors, seasoned industry advisors, and entrepreneurial peers. The government can support and bolster the connective tissue of startup ecosystems by, for example, funding incubators, accelerators, and entrepreneurial support organizations that focus on underrepresented founders. And it should actively meet startups where they are, by attending conventions or working through regional offices to facilitate access to government resources and hear directly from startups about what they need from policymakers.

Finally, the talent pipeline is key. It is critical that training resources are equitably distributed, but all young people—no matter their zipcode—should be encouraged to be innovators. Unfortunately, certain students lack access to STEM education, but even those who pursue it often abandon STEM before they choose a career. The government can—and should—spend more on education, but it should figure out how to get “smarter” about training tomorrow’s innovators. For many innovators, their path will not include a university degree. Part of building the talent pipeline will require new curricula to highlight accomplished innovators from underrepresented backgrounds. The government should also focus on attracting and retaining more diverse STEM educators. And finally, the government should invest in improved, dedicated innovation and entrepreneurship education, to train creative, innovative young people and equip them with the tools they need to succeed in solving problems and developing new ideas into practical solutions through advanced technology.

IMPORTANCE OF DIVERSITY

Engine applauds the USPTO and the NCEAI for seeking to increase diversity throughout American's innovation ecosystems. Promoting diversity and inclusion in innovation is not only the right thing to do, it also makes for the best economic policy.² Studies show that diverse teams produce better financial returns and more innovation: racially and gender diverse teams are 33 percent and 21 percent more likely to be profitable than their less-diverse peer teams, respectively.³ The diversity of a company's leadership correlates to increased innovation, measured by the revenue attributable to new products and services.⁴ And innovative companies whose leaders exhibit inherent and acquired diversity are likelier to capture new market share and report market share growth.⁵

Generations of American inventors from many different backgrounds have created countless products and processes that enrich our lives and power our economy. Percy Julian created fire-retardant foam used throughout World War II,⁶ Sarah Boone was fundamental in developing the modern ironing board,⁷ and Katharine Burr Blodgett made "invisible" glass,⁸ a key component of computer screens today, just to name a few. Julian, Boone, and Blodgett are all examples of women and Black American founders and inventors, merely some of the innovators from underrepresented backgrounds who have driven America's scientific progress.

Similarly, diversity can impact—and improve—the direction of product development and innovation. Diverse teams serve a more diverse customer base, and bring unique perspectives to develop solutions to more problems experienced by more people.⁹ Merely by way of example, engineers who navigate the world in a wheelchair will more readily see opportunities to improve accessibility in public transit; women are more likely to introduce innovative new services that cater to the

purchasing needs of women;¹⁰ and multilingual teams will better notice the value of testing voice recognition technology on many accents.¹¹ And these varied perspectives are integral to keeping American startups at the forefront of global innovation.

Startup Testimonial:

On running a startup focused on the race and gender accuracy of facial recognition: "Facial recognition technology has far-reaching implications. We saw this [] during the George Floyd protests, when law enforcement relied on inaccurate facial recognition technology. The issue also affects me and the people I care about. I am Black and I am a woman, and we know that facial recognition technology is particularly bad at identifying people of color and women. . . . Part of my social responsibility and holding Infiltron accountable is through working with teams that are diverse. For the company I am building and the solutions we are building, diversity will show in what we build, attending to accuracy and defending against racial or gender bias." ¹²

² See Rocio Lorenzo, Nicole Voigt, Miki Tansaka, Matt Krenitz, & Katie Abonzhir, *How Diverse Leadership Teams Boost Innovation*, Bos. Consulting Grp. (Jan. 23, 2018), <https://www.bcg.com/en-us/publications/2018/how-diverse-leadership-teams-boost-innovation>; Vivian Hunt, Larina Yee, Sara Prince, & Sindiam Dixon-Fyle, *Delivering Through Diversity*, McKinsey & Co. (Jan. 18, 2018), <https://www.mckinsey.com/business-functions/organization/out-insights/delivering-through-diversity>.

³ Hunt et al., *supra* note 2.

⁴ Lorenzo et al., *supra* note 2.

⁵ Sylvia Ann Hewlett, Melinda Marshall, & Laura Sherbin, *How Diversity Can Drive Innovation*, Harv. Bus. Rev. (Dec. 2013), <https://hbr.org/2013/12/how-diversity-can-drive-innovation>.

⁶ Percy Julian - Facts, Inventions & Death, Biography (Jan. 8, 2021), <https://www.biography.com/scientist/percy-julian>.

⁷ Sarah Boone - Invention, Ironing Board & Facts, Biography (Jan. 13, 2021), <https://www.biography.com/inventor/sarah-boone>.

⁸ Lucinda Roberts, *The Invisible Woman*, Science History Institute - Distillations (Mar. 3, 2014), <https://www.sciencehistory.org/distillations/the-invisible-woman>.

⁹ See, e.g., Edward Graham, *Stylagine Reinvents Online Shopping*,

Engine (June 14, 2019), <https://www.engine.is/news/category/startupseverywhere-providence-rhode-island> ("There's a huge opportunity in the finding community to create funds for women and minorities. . . . [Investors] should also be aware that if you're not in those communities, you don't know what their needs are. Every one of those needs has a solution that is potentially profitable") (quoting Sarah Fletcher, co-founder of Stylagine in Rhode Island) [hereinafter "Stylagine"].

¹⁰ Modyue Akianawom, *By Having a Diverse Team Will Make Your Products Better*, N.Y. Times Open (May 23, 2017), <https://open.nytimes.com/why-having-a-diverse-team-will-make-your-products-better-c73e7518f677>.

¹¹ Laura Evans, *I'm a Latina Veteran Who Works at Amazon. Diversity Isn't About Checking a Box*, Fast Company (July 30, 2020), <https://www.fastcompany.com/90532486/im-a-latina-veteran-who-works-at-amazon-diversity-isnt-about-checking-a-box>.

¹² Edward Graham, *Saving Data and Devise from Hackers*, Engine (Nov. 11, 2020), <https://www.engine.is/news/startupseverywhere-warner-robins-ga-infiltron> (quoting Chasity Wright, founder and CEO of Infiltron in Georgia) [hereinafter "Infiltron"].



IMPORTANCE OF DIVERSITY

Moreover, increasing diversity in the nation's innovation ecosystems is one path toward creating wealth and building the jobs of the future in communities across the country that have been historically marginalized and excluded from these benefits without justification.¹³ And the COVID-19 pandemic has escalated the need for concerted focus on advancing diversity in innovation sectors, as women—especially Black and Latina women—are being driven from the workforce in significant numbers.¹⁴ Rapidly increasing unemployment rates now put a finer point on the inequity that existed in innovation sectors before the pandemic, and ratchets up the urgency for effective government intervention now.

With all of this in view, it is apparent that the value of and need for greater diversity and inclusion in U.S. innovation is paramount. Likewise, as USPTO and members of the NCEAI no-doubt know, the barriers facing underrepresented founders are complex and reaching. And they extend far beyond the patent system. Of course, the solutions to expand U.S. innovation cannot be one-size-fits-all. The NCEAI and USPTO should instead carefully consider the unique needs of different underrepresented founders and propose a variety of strategies to support innovators across, e.g., race, gender, and geography. Otherwise, the country risks implementing policies that only help a few and continue to unfairly leave many innovators behind.

Engine urges the USPTO and NCEAI to thoroughly examine the complex barriers underrepresented founders face, and consider a broad range of bold, creative solutions. Were NCEAI merely to take a narrow focus on barriers to patenting, it would be missing an opportunity to contribute real value toward advancing diversity in innovation. To be sure, patenting is a valuable part of some innovators' startup models, but innovation is not always about a patentable invention—valuable innovation can include new business models,¹⁵ or customer outreach services. All underrepresented innovators and entrepreneurs, regardless of whether they want or need

patents, also deserve the attention and support of the USPTO, NCEAI, and the federal government more broadly.

Indeed, agencies and officials across the federal government have a critical role to play in dismantling the unjust barriers facing underrepresented founders. Advancing diversity in innovation and entrepreneurship will require dedicated efforts from all branches and levels of government, not just the USPTO. For example, the Small Business Administration, National Science Foundation, and Department of Education each have expertise and authority that can be brought to bear and should take a prominent role in the government's efforts to expand American innovation. And some steps will require Congressional action. Engine encourages USPTO and NCEAI to share findings with other agencies and tap into parallel efforts underway elsewhere.

¹³ See, e.g., *Why 1863?*, 1863 Ventures, <https://www.1863ventures.net/why-1863> (last visited Feb. 2, 2021) ("Our thesis is that entrepreneurship is becoming an increasingly viable pathway for the New Majority to build wealth. Our goal is to facilitate this trend by reducing barriers and risk for these founders across the nation.")

¹⁴ Lolita Garcia-Navarro, Interview with Elise Gould, *The Economic Fallout of the Pandemic Has Had a Profound Effect on Women*, NPR (Jan. 31, 2021), <https://www.npr.org/2021/01/31/962528953/the-economic-fallout-of-the-pandemic-has-had-a-profound-effect-on-women>.

¹⁵ But the value of a patent is often not the incentive to invent, especially for startups. See Stuart J.H. Graham, Robert P. Merges, Pam Samuelson, & Ted Sichelman, *High Technology Entrepreneurs and the Patent System: Results of the 2008 Berkeley Patent Survey*, 24 Berkeley Tech. L.J. 1255, 1296–97 (2009).



PATENTING

Technology startups create promising innovations and develop them for the benefit of their customers and the public. Many startups continue in the footsteps of Percy Julian, Sarah Boone, and Katharine Burr Blodgett by seeking patents. Some inventors hope to license to fund further research and development,¹⁶ and others want strategic advantages associated with being the first to patent.¹⁷ For others, patents are not a part of their innovation strategy.¹⁸ Moreover, when the USPTO issues a patent, that has far-reaching economic consequences. And many startups' only interaction with the patent system is when they are accused of infringement. But there are few avenues for the public to engage with the Office, as it interacts almost exclusively with patent applicants (or owners), and has very few ways to hear "from those who stand to suffer immensely" from, e.g., improvidently granted patents.¹⁹ In thinking about the importance of diversity within the patent system, the USPTO and NCEAI should not take a myopic view and misunderstand patent applicants or owners as the only relevant stakeholders. As detailed further below, Engine encourages the USPTO and NCEAI to focus on the whole innovation sector, but here presents issues and some possible solutions underrepresented innovators face in patenting.

STARK DISPARITIES IN PATENT OWNERSHIP EXIST.

Examples of excellence do not mitigate legacies of discrimination.

Our history is full of stories of inventors from communities who have been underrepresented in innovation and prevented from fully exploring the fruits of their labor. Enslaved Black artisans literally built the Capitol building and the White House.²⁰ Across generations, Black inventors' talents have

been stolen and undervalued by American racism, and this is reflected in our patent system. Despite this inglorious history, many Black inventors were able to unleash their talent during America's Golden Age of Invention. Black inventors were awarded 50,000 patents between 1870 and 1940, making Black people among the most patent-productive groups of Americans at the time.²¹ This was in spite of Jim Crow-era anti-Black violence that, according to pathbreaking research by Professor Lisa Cook, robbed the U.S. of an estimated 1,100 patented inventions.²² In fact, Black Americans' patent rates have never recovered from their high at the turn of the 20th century.²³ The consequences of our history reverberate into patent disparities today. Black American innovations from the past to the present, despite significant obstacles, should not be interpreted as a sign of historic inclusion.

American women also have patented inventions for centuries, despite significant barriers. Hannah Wilkinson Slater is considered by many to be the first (white) woman to receive a patent in the U.S., in 1793,²⁴ and Sarah Goode was the first Black woman granted a patent, in 1885.²⁵ Coverture doctrine in early America meant that legal title to a patent went to a married woman's husband. Some scholars suggest that this early legal regime stopped many women from commercializing their inventions.²⁶ Similarly, enslaved Black women could not receive patents.²⁷ Best estimates suggest that women inventors overall composed about 4 to 8 percent of patent recipients between 1870 and 1940.²⁸ The rates for Black women are much lower:

²¹ Jonathan Rothwell, Ande M. Perry & Mike Perry, *The Black Innovators Who Educated the United States: Reassessing the Golden Age of Invention*, Metropolitan Policy Program, Brookings Inst. (Nov. 23, 2020), <https://www.brookings.edu/research/the-black-innovators-who-educated-the-united-states-reassessing-the-golden-age-of-invention/>.

²² Lisa D. Cook, *Violence and Economic Activity: Evidence from African American Patents, 1870-1940*, 19 J. Econ. Growth 221, 239 (2014).

²³ Rothwell et al., *supra* note 21.

²⁴ *Progress and Potential: A Profile of Women Inventors on U.S. Patents*, Office of the Chief Economist, U.S. Patent and Trademark Office, 2019 IP Data Highlights 2, 3 <https://www.uspto.gov/sites/default/files/documents/Progress-and-Potential.pdf>.

²⁵ Sarah Boone, *supra* note 7.

²⁶ Daniel H. Shulman & Angela Upchurch, *Special Rights to Inventions: A Latent Threat in Corporate Patent Portfolios*, 50 Seton Hall L. Rev. 1, 4 (2019); B. Zonia Khan, *Married Women's Property Laws and Female Commercial Activity: Evidence from United States Patent Records, 1790-1895*, 56 J. Econ. Hist. 356, 385 (1996).

²⁷ Shontavia Jackson Johnson, *The Colorblind Patent System and Black Inventors*, 11 *Landslide* 4 (2019), https://www.americanbar.org/groups/intellectual_property_law/publications/landslide/2018-19/match-aptl/colorblind-patent-system-black-inventors/.

²⁸ *Report to Congress Pursuant to P.L. 115-275, the SUCCEEDS Act*, U.S. Patent and Trademark Office 8 (Oct. 2019), <https://www.uspto.gov/sites/default/files/documents/USPTO%20SuccessAct.pdf>; see Sarata et al., *Historical Changes in the Demographics of Inventors in the United States* (Jan. 30, 2017), <https://ssrn.com/abstract=2908160>.

¹⁶ See, e.g., *id.* at 1300 (recounting anonymous inventor's story).

¹⁷ Bhaven N. Sampat, *A Survey of Empirical Evidence on Patents and Innovation* 5, 9 (Nat'l Bureau of Econ. Resch., Working Paper No. 25383, 2018), https://www.nber.org/system/files/working_papers/w25383/w25383.pdf.

¹⁸ *Id.* at 20 ("A considerable amount of innovation occurs outside the patent system.")

¹⁹ Paul Krishitel, *Opinion, The Path to Racial Justice Runs Through This Agency*, N.Y. Times (Feb. 9, 2021), <https://www.nytimes.com/2021/02/09/opinion/biden-patent-office.html?hpid=click&module=Opinion&pgtype=Homepage>.

²⁰ Felicia Bell, *Enslaved Labor and the Capitol*, U.S. Capital Hist. Soc'y (2003), <https://uschs.org/explore/historical-articles/enslaved-labor-nited-states-capitol/>; *Slavery and the White House*, White House Hist. Ass'n (last visited Feb. 15, 2021), <https://www.whitehousehistory.org/press-room/press-backgrounders/slavery-and-the-white-house>.



PATENTING

“historians can identify only four African-American women who were granted patents for their inventions” between 1865 and 1900.²⁹ To understand and rectify today’s patent disparities, we must relearn our past.

Historic disparities persist today.

The latest data suggest that, while underrepresented inventors make up a larger share of the tech community than ever, reaching equity will require much more work. Despite being more than half the U.S. population, and holding about a quarter of science and engineering jobs, women made up only 13 percent of all inventor-patentees.³⁰ The USPTO has not released official data on inventor-patentees by race, but multiple studies suggest that Black people and Latinos, as well as Native Americans, are dramatically underrepresented.³¹ Separately, some studies suggest that women inventors emerge from the patent prosecution process with fewer claims approved and more alterations of their claims (therefore potentially lowering the claims’ value) than men.³² Evidence also suggests that patent examiners may be inclined to treat applications from inventors of the same gender more favorably.³³ These data suggest the legal and cultural barriers to diverse and inclusive patenting may have abated over time but remain substantial.

MAKING THE PATENT SYSTEM MORE INCLUSIVE.

Embodying diversity and minimizing bias.

The Biden-Harris Administration has an early opportunity to nominate a USPTO Director who embodies diversity and

values inclusion,³⁴ alongside Commerce Secretary-designate Gina Raimondo and Small Business Administrator-designate Isabel Guzman. The Administration should also seek to grow diversity within the rest of USPTO leadership and among USPTO’s employees—by attracting and retaining a diverse slate of examiners and administrative patent judges.³⁵

The next USPTO Director should also move quickly to minimize bias in patent examination. To start, she should launch a pilot program to de-identify patent applicants—removing inventor and attorney names.³⁶ The Director should also launch an independent investigation to understand the role of systemic racism and bias within the patent system.

Creating better demographic data sets.

Part of understanding these problems of underrepresentation is being able to quantify them, and the USPTO needs metrics to monitor progress. To that end, it should collect demographic data from patent applicants, and “more systematically collect and distribute data about assignees that support the tracking of startups, small businesses, independent inventors, minority- and veteran-owned businesses.”³⁷ And this data should support investigations into possible implicit, structural, or other bias in the patent system. The USPTO should also examine how it can act under its current authority to implement proposals within the IDEA Act to better collect and disseminate demographic data throughout the patent application process.³⁸ A strong early focus on equity, backed by data from an authoritative source, would help the country understand and address gaps in invention and innovation.

²⁹ Leila McNeill, *These Four Black Women Inventors Reimagined the Technology of the Home*, Smithsonianmag.com (Feb. 7, 2017), <https://www.smithsonianmag.com/science-nature/these-four-black-women-inventors-reimagined-technology-home-180962060/>.

³⁰ *USPTO Progress Report*, supra note 28, at 8–10; *Progress and Potential*, supra note 24, at 2, 4 <https://www.uspto.gov/sites/default/files/documents/OCE-DH-Progress-Potential-2020.pdf>.

³¹ *USPTO Progress Report*, supra note 28, at 11–14.

³² Kyle Jensen et al., *Gender Differences in Obtaining and Maintaining Patent Rights*, 36 *Nature Biotechnology* 307, 308 (2018).

³³ Premay Desai, *Bias? Regulators: Evidence from Patent Examiners* (Nov. 10, 2019) (unpublished manuscript), https://www.hbs.se/contentassets/8d2ad16aa547b68404hd15702b35/20117-ijpm-premay-desai_ssrn-id3485963.pdf; see also Michael Riech, *Race and Gender in the USPTO: Scientist’s Hard Data for Hard Issues*, *Written Description* (Aug. 18, 2020), <https://writendescription.blogspot.com/2020/08/race-and-gender-in-uspto-schusters-hand.html>.

³⁴ Letter from Engine to President Joe Biden and Vice President Kamala Harris (Jan. 19, 2021), <https://www.engine.is/news/engine-asks-biden-harris-team-to-consider-startups-when-naming-next-uspto-director>.

³⁵ The USPTO should also consider adding diversity to its public advisory committees. See Priya Krishnel, *The Path to Racial Justice Runs Through This Agency*, *N.Y. Times* (Feb. 9, 2021), <https://www.nytimes.com/2021/02/09/opinion/biden-patent-office.html>.

³⁶ *U.S. Patent and Trademark Office (USPTO) Transition Document, Day One Project 5* (last accessed Feb. 15, 2021), available at <https://9381c384-0c59-41d7-bbdf-62bbf54449a6.filesusr.com/ugd/14d834-fa6b0d730acb491fa81b0fce54cfbe18.pdf>.

³⁷ Colleen V. Chien, *Increasing Diversity in Innovation by Tracking Women, Minority, and Startup Innovators that Patent and Supporting Experimentation in Inclusive Innovation* (June 30, 2019), available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3413805.

³⁸ Press Release, U.S. Representative Nydia M. Velázquez, Velázquez, Stivers, Hirono, Tillis, Introduce Bipartisan, Bicameral Bill to Help Close Patent Gap Faced by Women, Minorities (July 25, 2019), <https://velazquez.house.gov/media-center/press-releases/velazquez-stivers-hirono-tillis-introduce-bipartisan-bicameral-bill-help>.



PATENTING

Helping underrepresented inventors seek high-quality patents.

Patent quality is essential to startups. High-quality patents can be a valuable asset for underrepresented founders growing emerging tech companies. But when the USPTO issues low-quality patents—which sometimes happens—those patents operate as a drain on innovation. Moreover, low-quality patents create problems for patent owners—innovators and entrepreneurs who spent time and money on a patent application that has little (if any) value.³⁹

But to obtain a high-quality patent, an inventor needs financial resources to cover, e.g., prior art searches, specification and claim drafting, and prosecution counsel. It is critical that underrepresented inventors seeking patent protection can access the resources they need to support issuance of a high-quality patent.

The USPTO should take (and Congress should support) more direct steps to help underrepresented inventors who choose to file for a patent obtain a high-quality patent. And that focus on quality should remain paramount. Professor Colleen Chien and her students have documented that smaller firms, such as startups, are over 40 percent less likely to have an application end in a patent, signaling that many startups that do file patents may need assistance during the application process.⁴⁰ On top of that, underrepresented innovators often have less access to capital and social networks of other innovators, which can leave them with fewer resources to tap for guidance or assistance in navigating the examination process.

Congress and the USPTO have both acted in recent years to support underrepresented innovators. The America Invents Act (AIA) was an important step. It allowed the USPTO to adjust its fees and establish a lower fee rate for smaller applicants.⁴¹ It created a pro bono program to assist under-resourced inventors and small businesses.⁴² And it established regional USPTO offices, making it easier for inventors across the country to access the Office's resources.⁴³

³⁹ Comment by Engue to the Subcommittee on Intellectual Property of the Senate Judiciary Committee (Nov. 6, 2019), available at <https://www.engue.is/news/engue-submits-comments-to-senate-judiciary-subcommittee-on-patent-quality>.

⁴⁰ Colleen V. Chien et al., *Guest Post: Advancing Inclusive Innovation and Entrepreneurship through the Patent System*, Patently-O (Nov. 4, 2020), <https://patentlyo.com/patent/2020/11/advancing-innovation-entrepreneurship.html>.

⁴¹ John R. Thomas, *The Leahy-Smith America Invents Act: Innovation Issues*, Cong. Res. Serv. 17 (Jan. 15, 2014), <https://fas.org/sgp/crs/nisic/R42014.pdf>.

⁴² E.g., *Inventors*, U.S. Patent and Trademark Office (June 1, 2020), <https://www.uspto.gov/patents/basics/using-legal-services/pro-bono/inventors>.

⁴³ Michelle K. Lee, *Report on Satellite Offices*, U.S. Patent and Trademark Office, https://www.uspto.gov/sites/default/files/sia_implementation/

But more can be done. For example, as USPTO staff previously noted, applicants may benefit from accessible online tools for the pre-submission process.⁴⁴ Better low- and no-cost tools to research prior art would help both applicants and examiners. The pro bono program should be more accessible and prioritized to include more lawyers from underrepresented backgrounds. And USPTO should also move to diversify the patent bar by relaxing the technical requirements for the patent bar,⁴⁵ because the lack of representation among patent prosecutors, in part, reflects the lack of representation in the relevant degree programs.⁴⁶ The government should also ensure startups wrongly-accused of infringement can afford to challenge low-quality patents or avoid the steep costs of frivolous litigation.⁴⁷

Finally, given the successes of its newer regional office structure, the USPTO should consider adding another regional office and expanding resources for existing ones. Creating a regional office in the southeastern U.S., for example near Atlanta, could add a lot of value. The region is home to several historically Black colleges and universities (HBCUs) and has burgeoning startup industries, but currently lacks a dedicated USPTO office.

Startup Testimonial:

On applying for a patent as a woman entrepreneur: "I would like to see the U.S. government do something [I] like create a program for women and minorities, because it's just such a heavy lift. . . . So I think the government should consider setting up programs [for women and minorities] to help reduce some of the financial burdens of the patent process."⁴⁸

USPTO_AIASatelliteOfficesReport_2014Sept30_Online.pdf.

⁴⁴ E.g., *Patent Quality Chat, Application readiness: Assessing incoming applications*, U.S. Patent and Trademark Office 20 (Feb. 19, 2020), https://www.uspto.gov/sites/default/files/documents/Patent%20Qual%20Chat%20Application%20Readiness%2019_2020%20for%20posting.pdf.

⁴⁵ See General Requirements Bulletin, U.S. Patent and Trademark Office, available at https://www.uspto.gov/sites/default/files/documents/OED_GRB.pdf.

⁴⁶ See Eric L. Goldman et al., *Boosting Patent Diversity by Relaxing the Technical Barriers in Patent Bar Membership*, Docket No. PTO-C-2019-0010 (June 30, 2019), available at <https://www.uspto.gov/sites/default/files/documents/SUCCESSAct-Goldman-et-al.pdf>.

⁴⁷ See, e.g., Comments of Engue Advocacy in Response to Setting and Adjusting Patent Fees During Fiscal Year 2020, Proposed Rule, Docket No. PTO-P-2018-0031 (Sept. 30, 2019), available at https://static1.squarespace.com/static/571681753c44d835440e8b51/t/5d92500377d267dc66349f1/1569809827579/2019.09.30_Comments+to+Docket+PTO+P+2018+0031.pdf (discussing disproportionate costs to challenge low-quality patents).

⁴⁸ Graham, *Stylized*, *supra* note 9.

ACCESS TO CAPITAL

The most significant challenge facing almost every startup innovator is access to capital—but this is especially true for underrepresented founders. These groups of entrepreneurs face unique and complex barriers to raising the money they need to launch and grow their businesses and introduce new technologies. But the government can, and should, help dismantle those barriers and create new funding channels for historically underrepresented innovators.

Underrepresented founders face serious barriers across every traditional startup funding stream.

The most common forms of startup funding are routinely and unfairly unavailable to underrepresented founders.

Cash and credit can propel a groundbreaking idea into a successful business, but that capital is often not accessible to underrepresented founders. An entrepreneur with access to enough capital to hire, research, and expand has a head start on others who must choose between, e.g., new hires or a new product line. Most startups begin their financial journeys by raising money from the founders and their family.⁴⁰ The head start begins there: systemic racism and sexism mean that many entrepreneurs cannot equitably access those traditional sources of capital. The gender and racial pay gaps are well-known illustrations of this problem. For every dollar a white man earns in America, white women earn approximately 79 cents; Black men, 67 cents; Black women, 62 cents; Latino men, 68 cents; Latina women, 54 cents.⁵⁰ These disparities remain when analyzing the family wealth gap. In the U.S., for every dollar the average Black family owns, the average white family owns about eight dollars; for every one dollar of assets the average Latino family owns, the average white family owns

⁴⁰ *Startup Financing Trends by Race: How Access to Capital Impacts Profitability*, Annual Survey of Entrepreneurs Data Briefing Series, (Kauffman Foundation, Kansas City, MO), Oct. 2016, https://www.kauffman.org/wp-content/uploads/2019/12/ase_brief_startup_financing_by_race.pdf.
⁵⁰ It is worth noting that while the data trends are consistent across sources, exact figures differ by source. See, e.g., Dajet Leonardi, *The Black-White Wage Gap Is as Big as It Was in 1950*, N.Y. Times (June 25, 2020), <https://www.nytimes.com/2020/06/25/opinion/sunday/race-wage-gap.html>; Press Release, Economic Policy Institute, *Latino workers—Particularly Women—Have Faced Some of the Most Damaging Economic and Health Effects of the Coronavirus* (Aug. 20, 2020), <https://www.epti.org/press/latino-workers-particularly-women>.

about six dollars.⁵¹ And while the average single white woman's wealth is about half as much as the average white man (the "singles wealth gap"), comparable figures for Black people and Latinos are insulting: single Black men's wealth is equivalent to 1% of single white men; 0.69% for Black women; 3.3% for Latino men; 0.35% for Latina women.⁵² The inequities in access to capital start with underrepresented innovators' relative lack of income and wealth and balloon from there.



have faced some of the most damaging economic and health effects of the coronavirus.⁵³ *Quick Facts About the Gender Wage Gap* (Center for American Progress, Washington, D.C.), Mar. 24, 2020, at 1–2, https://cdn.americanprogress.org/content/uploads/2020/05/25153916/Gender-Wage-Gaps.pdf?_ga=2.77896212.1092372900.1612138845.1354523628.1612138845.
⁵¹ Courtney Coumley, *New Census Data Reveals No Progress Has Been Made on Closing the Overall Gender Pay Gap*, CNBC, Make It (Sept. 18, 2020), <https://www.cnbc.com/2020/09/18/new-census-data-reveals-no-progress-has-been-made-closing-the-gender-pay-gap.html>.
⁵² Neil Bhunia, et al., *Disparities in Wealth by Race and Ethnicity in the 2019 Survey of Consumer Finances*, Board of Governors of the Federal Reserve System: FEDS Notes (Sept. 28, 2020), <https://www.federalreserve.gov/econres/notes/feds-notes/disparities-in-wealth-by-race-and-ethnicity-in-the-2019-survey-of-consumer-finances-20200928.htm>.
⁵³ *Women and Wealth: Insights for Grantmakers* (Asset Builders Network, Evanston, Ill.), 2005, at 5, https://assetbuilders.org/wp-content/uploads/Women_Wealth_Insights_Grantsmakers_brief_15.pdf.

ACCESS TO CAPITAL

Underrepresented founders also have less access to outside financing. Relative to white men, Black and Latino small business owners rely more on capital from personal and family sources, utilize business loans less, and their loans have higher interest rates.⁵³ Women-owned small businesses also receive less in business loans than small businesses owned by men.⁵⁴ And all of these underrepresented groups report higher reticence to seek out business loans out of a fear of rejection.⁵⁵

Startup Testimonial:

"Until the whole of government addresses the generation wealth gap, the food insecurities a lot of our families suffer, and the educational challenges we continue to have, then everything else is just lip service. You can't grow prosperous communities when people are hungry, poorly educated, and the Black-white wealth gap is what it is right now. The net worth of a typical white family is nearly 10 times greater than that of a Black family." ⁵⁶

These gaps in capital are the result of several factors. For example, about 1 in 20 American families lack any relationship with banks, and even more families utilize credit outside the banking system, such as payday or auto title loans.⁵⁷ The FDIC found that Black and Latino households were more likely to use

nonbank credit, even after controlling for income.⁵⁸ It seems likely that recent trends of bank branch closures in Black and rural neighborhoods (the latter particularly impacting Latino and Native American communities) will only worsen these issues.⁵⁹ Similarly, over the past two decades, half of Black-owned banks have closed.⁶⁰ Disparities in credit scores are also an important factor here: studies suggest that women, Black people, and Latinos all have relatively lower credit scores.⁶¹ Income and wealth inequality result in systemic differences in credit scores, which are then used by banks to determine who does and does not get a loan. In addition, Black people and Latinos receive unequal and worse treatment by financial institutions, even after controlling for disparities in income, wealth, and credit scores.⁶²

At the same time, Black- and Latino-owned small businesses are often pushed to use riskier credit options to capitalize their businesses—including personal credit cards and cash advances—at higher rates than white-owned small businesses.⁶³ These closed doors to traditional financing push underrepresented founders towards riskier alternatives to make their visions a reality, and unfortunately may push many out of innovation altogether.

⁵³ *Id.* at 8-9.

⁵⁴ See, e.g., Zach Fox et al., *Bank branch closures take greatest toll on majority-black areas*, S&P Global Market Intelligence (July 25, 2019), <https://www.spglobal.com/marketing/intelligence/enr/news-insights/latam-news-headlines/bank-branch-closures-take-greatest-toll-on-majority-black-areas-52872925>; *Bank Branch Closures from 2008-2016: Unequal Impact in America's Heartland*, Rsch. Memo (Nat'l Cmty. Reinvestment Coal., Washington, D.C.), May 2017, https://ncrc.org/wp-content/uploads/2017/05/NCRC_Branch_Deserts_Research_Memo_050517_2.pdf.

⁵⁵ Cameron Costa, *Minority Entrepreneurs at a Tipping Point as Black-Owned Banks Dwindle in the U.S.*, CNBC (Aug. 25, 2020), <https://www.cnbc.com/2020/08/25/minority-entrepreneurs-at-tipping-point-as-black-owned-banks-dwindle.html>.

⁵⁶ See, e.g., *Women Business Owners*, *supra* note 54, at 16; *Minority Small Business Credit*, *supra* note 53, at 6.

⁵⁷ See, e.g., *Disinvestment, Disengagement and Inequity in Small Business Lending* (Nat'l Cmty. Reinvestment Coal., Washington, DC), Sept. 2019, at 5-6 ("[W]hile the customer service experience of all applicants for small business credit is poor, it's even worse for [Black and Hispanic applicants]"; 29-30 ("The profiles of all testers was sufficiently strong that on paper, either profile would qualify them for a loan. Furthermore, the [Black and Hispanic testers] profiles were slightly better than their white counterparts in terms of income, assets and credit scores. — In almost every measure evaluated, white testers received superior customer service by being asked fewer questions about eligibility and receiving more information about the loan product than were their [Black and Hispanic counterparts]"; <https://ncrc.org/wp-content/uploads/2019/09/NCRC-Small-Business-Research-FINAL.pdf>; Press Release, Credit Sesame, *Black and Hispanic Americans on the U.S. Financial System: 'The Odds Were Always Against Me,' New Credit Sesame Survey Finds* (Jan. 26, 2021), <https://apnews.com/press-release/pr-newswire/business-race-and-ethnicity-north-america-public-opinion-african-americans-0441597a001de38936a9f64e8997bfc>.

⁵⁸ See *Startup Financing Trends by Race*, *supra* note 49 (Black Americans' lower credit card scores); *Minority Small Business Credit*, *supra* note 53, at 12.

⁵³ *Startup Financing Trends by Race*, *supra* note 49; see also Robert Fairlie et al., *Black and White Access to Capital among Minority-Owned Startups* 9-10, 25 (Stan. Inst. for Econ. Pol'y Rsch., Discussion Paper No. 17-03, 2016), <https://siep.stanford.edu/sites/default/files/publications/17-03.pdf>; see also *Small Business Credit Survey*, Rpt. on Minority-Owned Firms (Federal Reserve Bank of Atlanta, Atlanta, Ga.), Dec. 2019, at 16 (reporting higher interest rates), <https://www.fedsmba.com/medialibrary/fedsmba/files/2019/20191211-ccf-minority-owned-firms-report.pdf>.

⁵⁴ *Women Business Owners' Access to Capital Literature Review* (National Women's Business Council, Washington, D.C.), Mar. 1, 2018, at 14-15, https://cdn.www.nwbc.gov/wp-content/uploads/2018/03/28215658/NWBC-Report_Understanding-the-Landscape-Access-to-Capital-for-Women-Entrepreneurs.pdf.

⁵⁵ *Id.* at 15 (women); *Minority Small Business Credit*, *supra* note 53, at 9 (people of color).

⁵⁶ Edward Graham, *Supporting Innovation and Entrepreneurship in Southwest Arkansas*, Engine (July 31, 2020), <https://www.engine.is/news/startupseverywhere-pinebluff-ark-generator> (quoting Mildred Franco, Executive Director of The Generator at Go Forward Pine Bluff).

⁵⁷ *How America Banks: Household Use of Banking and Financial Services*, 2019 FDIC Survey, (FDIC, Washington, D.C.), Oct. 2020, at 1 (unbanked), 6-9 (finding higher rates of nonbank financial transactions), <https://www.fdic.gov/analysis/household-survey/2019esecensus.pdf>.

ACCESS TO CAPITAL

Startup Testimonial:

"But it's not just venture capital that is more challenging for underrepresented founders to access. Black and Brown founders often don't have a friends and family round—or they have one that's substantially smaller than their counterparts—due to the lack of generational wealth. In addition, when we consider securing loans, we often encounter additional barriers and difficulties." ⁶⁴

Equity investment from VC and angel investors is very unevenly distributed.

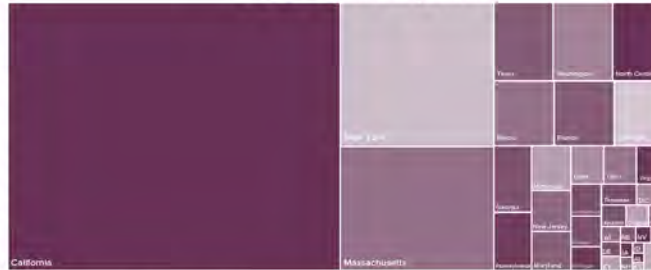
While VC is rightly acknowledged for successfully fueling much innovation, it has fallen enormously short in supporting diversity and inclusion. VC's modern origins chart from the post-WWII boom in the U.S., when several firms were founded in Boston and New York City in the 1940s.⁶⁵ VC emerged in California alongside the rise of the semiconductor industry in Silicon Valley in the 1950s and 1960s.⁶⁶ While less than 1 percent of all startups utilize VC funding,⁶⁷ that early mover advantage remains critical—over 70 percent of the \$130 billion in VC investment today goes to founders in three states: California, Massachusetts, and New York.⁶⁸ This

concentration speaks to many inequities—for example, less than 1 percent of VC investment goes to rural communities.⁶⁹ VC's demographic composition is similarly concentrated: only about 20 percent of VC professionals are women, 5 percent are Latino, and 3 percent are Black.⁷⁰ While VC was crucial to the successes of certain well-known companies like Facebook, Zynga, or Spotify, there are systemic failures in VC that must be addressed. And if addressed, could contribute to more startups led by diverse teams growing into household names.

Startup Testimonial:

"As a Black-owned business, funding has and continues to be a challenge. I reached out to hundreds of venture capitalists to raise funding . . . and I was unsuccessful. If it were not for the fact that I have a technology consulting company where I was able to see some revenue to bootstrap Postagraph, then the app wouldn't have been created." ⁷¹

VC Deal Volume By State



⁶⁴ Edward Graham, *Helping the Production Community Locate and Hire Talent*, Engine (Feb. 19, 2021), <https://www.engine.is/news/startupseverywhere-atlanta-go-filmconux> (quoting Carolyn Pitt, CEO and Founder of Film Conux) [hereinafter "Film Conux"].

⁶⁵ Martin Kenney, *How Venture Capital Became a Component of the US National System of Innovation*, 20 *Industrial and Corporate Change* 1677, 1687-89 (2011).

⁶⁶ *Id.* at 1689-90.

⁶⁷ Meredith Wood, *Raising Capital for Startups: 8 Statistics That Will Surprise You*, FundRazr (Feb. 3, 2020), <https://www.fundrazr.com/resources/startup-funding-statistics>.

⁶⁸ *Venture Capital Funding Report Q4 2020* (PwC/CB Insights), 2nd ed. 2021, at 37, <https://www.pwc.com/us/en/moneytree-report/assets/pwc-moneytree-2020-q4.pdf>.

⁶⁹ Matt McKenna, *Access to Capital Is Critical to Ensuring Success of Rural Entrepreneurs*, VC-List (June 6, 2018), <https://vc-list.com/startup-capital-rural-entrepreneurs/>.

⁷⁰ *NVCA-Deloitte Human Capital Survey* (NVCA/Deloitte), June 2019, at 7-9, available at <https://www2.deloitte.com/us/en/pages/audit/articles/diversity-venture-capital-human-capital-survey.html>.

⁷¹ Edward Graham, *The Digital Home: A Social Messaging Platform for Authentic and Private Connections*, Engine (Sept. 25, 2020), <https://www.engine.is/news/startupseverywhere-gaithersburg-md-postagraph> (quoting Pelomi Olatunpo, CEO of Postagraph in Maryland) [hereinafter "Postagraph"].

ACCESS TO CAPITAL

VC has not been a source of equitable financing for many underrepresented founders. Crunchbase estimates that women founders receive about 3 percent of venture capital, while Black and Latino founders receive a similar fraction of overall venture funds.⁷² And consistent with other trends, Black and Latino women receive a fraction of these fractions from the venture capital sector—less than 1 percent each.⁷³ While there have been recent efforts to increase racial and gender equity, VCs still have a long way to go.

Startup Testimonial:

"A lot of times, VC firms aren't looking for early-stage entrepreneurs or businesses, which is another big barrier. And a lot of Black and Brown entrepreneurs cater their services towards Black or Brown people, and investors can't see the vision or the mission of their companies. So they don't understand their focus, and then they skip over those entrepreneurs. If they look hard enough though, and if they really want to, they will find startups led by entrepreneurs of color."⁷⁴

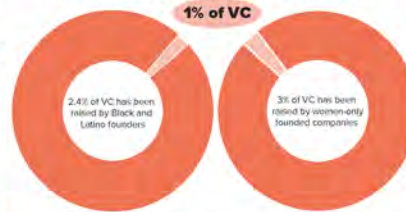
⁷² *Funding to the Female Founders* (Crunchbase, S.F., Cal.), Mar. 2020, at 5 ("In 2019, female-only founded companies raised 3 percent of venture dollars" (emphasis added)), https://about.crunchbase.com/wp-content/uploads/2020/03/Funding-to-Female-Founders_Report.pdf, *Funding to Black & Latino Founders*, Crunchbase Diversity Spotlight 2020 (Crunchbase, S.F., Cal.), Oct. 2020, at 4 ("So far in 2020, Black and Latinx founders have raised \$2.5 billion, representing 2.6 percent of funding through Aug 31, 2020" (emphasis added)), http://about.crunchbase.com/wp-content/uploads/2020/10/crunchbase_diversity_report_2020.pdf.

⁷³ Sources differ on exact figures, but there is consensus that the total figure is less than 1 percent. See, e.g., Jessica Guyton, *Racial inequality persists after COVID-19: Black women and Latina entrepreneurs get less than 1% of venture capital*, USA Today (Dec. 3, 2020) ("Black women-founded companies raised about \$700 million in funding from 2018-2019, a significant increase from the previous two-year period yet still account for 0.27% of the \$276.7 billion in venture capital investment"), <https://www.usatoday.com/story/tech/2020/12/02/black-women-latinas-venture-capital-systemic-racism-george-brayl/3795961001/>.

⁷⁴ Edward Graham, *A Platform to Help Professionals of Color Make Informal Career Choices*, Engine (June 12, 2020), <https://www.engine.is/news/startups/everywhen-mys-dipper> (quoting Neita Jenkins, Co-Founder of Dipper).

Gender and Racial Disparity in VC Funding

Black women & Latina founders receive less than 1% of VC



Disparities in VC Workforce:

By Percentage of Investment Professionals



Newer sources of startup funding may have some potential but present similar challenges for underrepresented founders. Angel investors—wealthier individual investors who back startups—are substantially smaller than VCs as a whole but can have high profiles.⁷⁵ While demographic investment data for angels is sparse, the demographic profile of angel investors is consistent with the VC industry as a whole—few women and fewer Black people and Latinos.⁷⁶

Many advocates suggest that equity crowdfunding may be a potential tool to combat discriminatory trends, and there are several crowdfunding platforms designed specifically for underrepresented founders.⁷⁷ But data on efficacy is hard to find. Some studies have

⁷⁵ *Angels: Foundational Investors in VC* (Pitchbook, Seattle, Wash.), Sept. 1, 2020, at 1-2, 6 ("While a relatively small slice of overall investment, angels still play an important role within the market"), available at <https://pitchbook.com/news/reports/q3-2020-pitchbook-analyst-note-angels-foundational-investors-to-vc>.

⁷⁶ *The American Angel* (Angel Capital Association/John Houston Fund for Angel Professionalism), Nov. 2017, 7 (reporting survey findings that 22.1 percent of angel investors were women, 2.3 percent were Latino and 1.3 percent were Black), <https://www.angelcapitalassociation.org/data/Documents/TAAReport11-30-17.pdf?ref=DB68>.

⁷⁷ See, e.g., *Crowdfunding, Cryptocurrency, and Capital: Alternative Sources of Business Capital for Black Entrepreneurs* (Congressional Black Caucus Foundation, Inc./Center for Policy Analysis and Research, Washington,

ACCESS TO CAPITAL

found that crowdfunding is a more welcoming environment for women founders. A PwC report found that women-led crowdfunding campaigns were 32 percent more successful than those led by men.⁷⁸

Fintech, firms focused on updating the banking model for the digital world, may hold similar promise in decreasing discrimination. While the fintech industry's demographics are no better than the broader technology industry,⁷⁹ studies suggest that, while finance algorithms discriminate against Black and Latino loan applicants, they may discriminate less in certain industries (e.g., mortgages) than traditional face-to-face lending.⁸⁰ Both the financial and technology sectors have lagged historically in tackling discrimination, but advances in fintech algorithm design could cut down on biased lending and promote greater equity. While some of these developments are encouraging, no matter the vector, the challenges to true equity in accessing capital remain deep.

Leveraging the government in expanding capital access across the board.

Making federal financing fairer and more equitable.

The federal government should take a leading role in creating a financial system that builds bridges to innovation instead of walls. That starts with addressing systemic problems within the government itself. As this pandemic demonstrated, federal programs can play an important role in exacerbating inequities, D.C., Mar 2019, 12-13, 15, <https://www.cbefinc.org/wp-content/uploads/2019/03/CPAR-Report-Crowdfunding-Cryptocurrency-FINAL.pdf>, Steven Oweby, *Crowdfunding Expands Access to Capital for Women, Minority Entrepreneurs*, Wash. Post (Apr. 7, 2013), <https://www.washingtonpost.com/business/capitalbusiness/crowdfunding-expands-access-to-capital-for-women-minority-entrepreneurs/2013/04/07/> (B7C)da-9d59-11e2-a2db-efc5298a95e1_story.html.

⁷⁸ *Women Unleashed: Unlocking Female Entrepreneurial Potential* (PwC/The Crowdfunding Center), July 2017, at 4, <https://www.pwc.com/gx/en/diversity-inclusion/assets/women-unbound.pdf>.

⁷⁹ *Advancing Gender Equity in the Fintech Community: Engaging Key Stakeholders to Drive Change*, Within Reach Series (Deloitte Center for Financial Services/100 Women in Finance), Oct. 2020, at 2. “[W]omen-founded fintechs [fintech startups] accounted for 3.1% of the total pool [of startups] in 2019.”, 3. “[I]n the world of startups, the global fintech founder community is still dominated by men, with women making up just 7% of the total pool,” available at https://www2.deloitte.com/us/en/insights/industry/financial-services/women-in-fintech.html#id=us:Zem_3na4dd018.5awc6di:MMDDYY:&pkid=1007338; see also Lauryn Nwankpa, *I’m a Black Woman in Fintech. My Industry Has to Overcome Its Bias to Survive*, Fast Company (Oct. 19, 2020), <https://www.fastcompany.com/90565223/in-a-black-woman-in-fintech-my-industry-has-to-overcome-its-racism-to-win-talent>.

⁸⁰ Robert Barlett et al., *Consumer Lending Discrimination in the Fintech Era*

as well as mitigating them. On the one hand, researchers suggest that COVID-19 relief efforts like enhanced unemployment insurance and stimulus checks kept millions of Americans out of poverty.⁸¹ But on the other, measures like the Paycheck Protection Program (PPP) failed to provide adequate support for Black and Latino-owned businesses, particularly those that were unbanked or underbanked.⁸² Data show, for example, that predominantly Black congressional districts got fewer PPP loans,⁸³ where applicants faced longer delays receiving funds;⁸⁴ minority-owned PPP applicants had to wait longer and try harder to have applications processed;⁸⁵ and Black applicants received worse treatment from banks.⁸⁶ The federal government must understand its failures and shortcomings in order to surmount them.

Expanding Existing Programs for Small Business Financing and Prioritizing Underrepresented Founders.

Startups can tap into many existing federal funding programs and Engine encourages the NCEAT to holistically review how best to improve and expand them. Some ideas include:

(Nat’l Bureau of Econ. Resch., Working Paper No. 25943, 2019), https://www.federalreserve.gov/system/files/working_papers/w25943/w25943.pdf, Thomas Philippon, *On Fintech and Financial Inclusion* (Nat’l Bureau of Econ. Resch., Working Paper No. 26350, 2019), https://www.federalreserve.gov/system/files/working_papers/w26350/w26350.pdf.

⁸¹ Meghan Roos, *First Stimulus Check Prevented Around 12.5 Million Americans from Poverty, Study Finds*, Newsweek (July 6, 2020), <https://www.newsweek.com/first-stimulus-check-prevented-around-125-million-americans-poverty-study-finds-1515694>; Ben Zappaver, *Over 13 Million More People Would Be in Poverty Without Unemployment Insurance and Stimulus Payments*, Economic Policy Institute Working Economics Blog (Sept. 17, 2020), <https://www.epi.org/blog/over-13-million-more-people-would-be-in-poverty-without-unemployment-insurance-and-stimulus-payments-senate-republicans-are-blocking-legislation-proven-to-reduce-poverty/>.

⁸² Megan Cerullo, *Up to 90% of Minority and Women Owners Shut Out Of Paycheck Protection Program, Experts Fear*, CBS News (Apr. 22, 2020), <https://www.cbsnews.com/news/women-minority-business-owners-paycheck-protection-program-loans/>.

⁸³ Inaai Moise, *Predominately Black Congressional Districts Got Fewer PPP Loans, Study*, Reuters (July 30, 2020), <https://www.reuters.com/article/us-health-coronavirus-ppp/predominately-black-congressional-districts-got-fewer-ppp-loans-study-idUSKCN24V24B7edition-redirect=ink>.

⁸⁴ Sifan Liu & Joseph Panella, *New Data Shows Small Businesses in Communities of Color Had Unequal Access to Federal COVID-19 Relief*, Brookings (Sept. 17, 2020), <https://www.brookings.edu/research/new-data-shows-small-businesses-in-communities-of-color-had-unequal-access-to-federal-covid-19-relief/>.

⁸⁵ Joyce M. Rosenberg & Justin Myers, *Minority-Owned Companies Waited Months for Loans, Data Shows*, Assoc. Press (Dec. 31, 2020), <https://apnews.com/article/technology-small-business-new-york-coronavirus-pandemic-7613e946275f085367b5fc8e9a490aea>.

⁸⁶ Emily Flinter, *Black Business Owners Had a Harder Time Getting Federal Aid, a Study Finds*, N.Y. Times (July 15, 2020), <https://www.nytimes.com/2020/07/15/business/paycheck-protection-program-bias.html>.



ACCESS TO CAPITAL

- Streamline and expand small business forgivable loan programs,⁸⁷ like PPP or SBAs 7(a) loans more broadly, so that Black- and Latino-owned businesses are not unfairly denied and have better access to (emergency) relief.⁸⁸
- Widen and simplify the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) programs to include more U.S. startups;
- Accelerate reforms and address acknowledged shortcomings in startup access to National Science Foundation (NSF) grants,⁸⁹ and expand funding; and
- Make direct equity investments,⁹⁰ such as in (1) startups struggling to meet operating demands during the global pandemic, or (2) industries critical to maintaining and enhancing U.S. global competitiveness.

Elevating, Establishing, and Strengthening Dedicated Organizations to Implement Priorities for Underrepresented Founders.

The federal government should start by adopting a holistic government approach centered on promoting innovation and entrepreneurship. Elevating the profile of underrepresented entrepreneurs would be a good step forward. Part of this should include attracting and retaining diverse leaders and employees across every government agency that funds or regulates research and development sectors. But dedicated organizations can provide necessary focus and momentum, as well as make the federal government's programs more accessible. One way to move forward would be enhancing the role and status of the Minority Business Development Agency (MBDA) within the Commerce Department. Under a proposal from the Center for American Progress, for example, the MBDA could be a one-stop shop for many underrepresented entrepreneurs: providing technical assistance, loans, and grants as well as a hub for internal advocacy across the executive branch.⁹¹

⁸⁷ *Startup-Oriented COVID-19 Relief Proposals* (Engine, Washington, D.C., 2020), at 2-3, <https://static1.squarespace.com/static/571681753c44d835e440c8b5/t/5f13e9ebd06c75789cbe6771595263468537/Engine+Proposals+for+Future+28Phase+4+29+COVID-Relief+Packages.pdf>.

⁸⁸ See Cecilio, *Minority Business Start out of PPP*, *supra* note 82.

⁸⁹ See Jane Edwards, *NSF Seeks to Reach More Startups Through 'Project Pitch' Platform*, *ExecutiveGov* (June 23, 2020), <https://www.executivegov.com/2020/06/nsf-seeks-to-reach-more-startups-through-project-pitch-platform/>.

⁹⁰ *Startup-Oriented COVID-19 Relief Proposals*, *supra* note 87, at 2.

⁹¹ *A Blueprint for Revamping the Minority Business Development Agency* (Center

Startup Testimonial:

"The government has programs that we can apply to in order to get money or support, which is great. However, they often forget that startups have very few resources or limited administrative capacity. In order to get the government funding, startup founders have to allocate hours and hours to get through the application process to secure any funding. When startups go through these lengthy and expensive processes, by the time they end up qualifying for funding, they could have gone out of business. If the government could establish some kind of entrepreneur-residency program to help startups with this process, then I think that would really help."⁹²

Addressing Sexism, Racism, and Bias in Federal Funding

Part of resolving existing disparity in federal funding will require ensuring that the government's decisions are being made by more diverse leaders and employees. But the government should also ensure it has the data it needs to drive better, more inclusive decisions in the future and that it takes steps to eliminate current bias.

Engine welcomes President Biden's fresh thinking about innovation policy by encouraging investment through targeting specific sectors, which could bring greater geographic diversity into the nation's innovation hubs.⁹³ While a good start, the Biden-Harris Administration must also take care that their research strategy is inclusive; one way to do this is to ensure that research priorities are set by diverse teams and that funding decisions are inclusive.⁹⁴ For example Vice President Harris and Representative

for American Product/CAP's National Advisory Council on Eliminating the Black-White Wealth Gap, Washington, D.C., July 31, 2020, <https://www.americanprogress.org/issues/race/reports/2020/07/31/488423-blueprint-revamping-minority-business-development-agency/>.

⁹² *Using Satellites and Technology to Detect Methane Leaks from Space*, Engine (Jan. 22, 2021), <https://www.engine.is/news/startups-everywhere-new-york-city-by-bluefield> (quoting Yotam Aniel, Founder and CEO of Bluefield Technologies).

⁹³ *The Biden Plan to Ensure the Future Is "Made in All of America" by All of America's Winners* (Biden-Harris campaign, Plaza, Penn.), 2020, <https://joebiden.com/made-in-america/>.

⁹⁴ See, e.g., Jeffrey Mervis, *Study Identifies a Key Reason Black Scientists are Less Likely to Receive NIH Funding*, *Science* (Oct. 9, 2019), <https://www.sciencemag.org/news/2019/10/study-identifies-key-reason-black->



ACCESS TO CAPITAL

Yvette Clarke elevated the need to research uterine fibroids, which disproportionately harm Black women.⁹⁵ And as the Biden-Harris Administration has brought on a diverse group of leaders within the White House and Cabinet, lower-level leadership and staff in the federal government must also reflect the diversity of America. Federal promotion of innovation and entrepreneurship should start with strengthening the government's capacity to engage with underrepresented founders.

In addition, the federal government should also improve its data collection and targeting capacity. For example, the IRS was more successful in distributing the second round of stimulus checks than the first time around—confirming that capacity exists for change.⁹⁶ But the lack of data collection and proper targeting seen within the USPTO and through the PPP are seen throughout the federal government. And even when data is collected, insufficient action follows. In the procurement process, for example, recent data show that only 10 percent of federal contracting went to disadvantaged small businesses, while only 5 percent went to women-owned small businesses.⁹⁷ Grant programs demonstrate similar disparities.⁹⁸ The White House should use its authority to encourage other departments and agencies to make similar strides in data collection and targeting, to better understand and assist underrepresented innovators. And once that data is collected, the federal government needs to move more quickly to rectify inequity.

scientists are less likely receive NIH funding.

⁹⁵ Renee G, *Kamala Harris Introduces Bill to Tackle Uterine Fibroids*, The Grön (Aug. 1, 2020), <https://thegron.com/2020/08/01/kamala-harris-bill-uterine-fibroids/>; Uterine Fibroid Research and Education Act of 2020, H.R. 6383, 116th Cong. (2020).

⁹⁶ Shahar Ziv, *IRS to Send Out Stimulus Checks Faster This Time*, Forbes (Dec. 21, 2020), <https://www.forbes.com/sites/shaharziv/2020/12/21/irs-to-send-out-stimulus-checks-faster-this-time-600-per-person-could-go-out-to-bank-accounts-next-week/?sh=598a64ba4e8b>.

⁹⁷ Press Release, U.S. Small Business Administration, *Federal Government Exceeds Small Business Contracting Goals by Awarding Record-Breaking \$132.9 Billion to Small Businesses* (Aug. 12, 2020), <https://www.pricewaterhouse.com/news-releases/federal-government-exceeds-small-business-contracting-goals-by-awarding-record-breaking-132-9-billion-to-small-businesses-301111199.html>.

⁹⁸ Michael A. Taft & Nicholas W. Gilpin, *Equity, Diversity and Inclusion: Racial Inequity in grant funding from the US National Institutes of Health*, eLife (2021), available at <https://elifesciences.org/articles/65697>; *Is There Gender Bias in Federal Grant Programs?*, Research Brief (RAND, Santa Monica, Cal.), 2005 ("[W]e found a gender gap in the amount of funding on average that females receive relative to their male counterparts at NIH, although important caveats are associated with that finding. Second, we found a gender gap in subsequent application rates."); Donna K. Günther et al., *Gender, Race/Ethnicity, and National Institutes of Health R01 Research Awards: Is There Evidence of a Double Bond for Women of Color?*, 91 Acad. Med. 1098 (2016), <https://journals.hww.com/academicmedicine/>



Creating New Indirect Financial Benefits to Support Underrepresented Founders.

The government currently offers numerous indirect financial benefits, in significant part through tax incentives, to support and encourage business. However, many extant tax incentives are a poor fit for startups and new tax incentives could be targeted to unique needs of underrepresented founders. For example, the government should:

- Grow and tailor research and development (R&D) tax credits to better support startups,⁹⁹ such as by offsetting income and payroll tax liability for small businesses that spend on R&D, or by expanding what counts as R&D to include common software development activities like user experience (UX) research and design;
- Prioritize employee retention and support the most nascent companies, such as through the First Employee credit in the PROGRESS Act.¹⁰⁰ Women-owned businesses tend to have less annual income, so they may not benefit from existing tax incentives. The PROGRESS Act would create a first employee credit that more women-owned companies and companies owned by underrepresented entrepreneurs of color could take advantage of sooner.¹⁰¹

The federal government should also do more to recognize the full extent of the work that startups do as well as to support founders' roles outside of the workplace. For example, women are disproportionately responsible for taking care of children, older adults, and sick family members in the U.S., which limits their opportunities to launch new tech or companies.¹⁰² Likewise many women—mothers and women of color in particular—have been pushed out of the workforce during the pandemic.¹⁰³ To support underrepresented founders, the government should expand family

Fulltext/2016/08000/Gender_Race_Ethnicity_and_National_Institutes_of_Health/23.aspx#ej-article-sam-container.

⁹⁹ *Startup-Oriented COI TD-19 Relief Proposals*, *supra* note 87, at 3-4.

¹⁰⁰ Press Release, Office of Senator Ron Wyden, *Wyden Introduces Bill to Boost Capital Access for Women-Owned Businesses* (Oct. 30, 2019), <https://www.finance.senate.gov/reading-members-news/wyden-introduces-bill-to-boost-capital-access-for-women-owned-business>.

¹⁰¹ This bill would also create an investor tax credit—a promising proposal discussed in a subsequent section.

¹⁰² E.g., Eduardo Porter, *Why Aren't More Women Working? They're Caring for Parents*, N.Y. Times (Aug. 29, 2019), <https://www.nytimes.com/2019/08/29/business/economy/labor-family-care.html>.

¹⁰³ Alexandra Kelley, *Women's Labor Force Participation Hits 33-Year Low*, The Hill Changing America (Feb. 8, 2021), <https://thehill.com/changing-america/respect/equality/537884-womens-labor-force-participation-hits-33-year-low>.

ACCESS TO CAPITAL

leave and other caregiver support programs—such as the child tax credit. And it should consider other creative ways to bring women with caregiving responsibilities (back) into the innovation sector.

Making Existing Funding Programs Work Better for Startups.

While federal grants and loans can be essential for many startups, the approval processes need to be quicker and more streamlined to better suit the startup lifecycle. The government should also leverage existing incubators and accelerators to improve government programs to fund diverse startups directly. Applying for grants is a lengthy and time-consuming process, with applicants competing for set amounts of money. This is often not suited to the startup lifecycle, where companies tend to need more flexibility and (a potentially smaller amount of) capital quickly. The government could funnel some traditional SBIR and STTR funding through incubators, accelerators, and innovation intermediaries who can disburse it directly into the startup ecosystems in their communities.¹⁰⁴ This would make government grants more nimble and allow more focus on underrepresented founders.

Incentivizing private investment.

The government can also encourage more inclusive innovation by incentivizing private investors to fund more diverse teams. Innovators have many great ideas but a serious need for flexible capital.

Creating Public-Private Partnerships.

Bringing public and private dollars together can help diversify innovation ecosystems through (1) increasing available funding, (2) increasing private lenders' (perceived) risk tolerance, and (3) prioritizing underrepresented founders in investment portfolios. One legislative proposal to partner the private and public sectors—the New Business Preservation Act—would help incentivize investments in startups by creating an equity investment program at the Treasury Department to give states the necessary funding to support the growth of new startups.¹⁰⁵ And that funding would be directed to underrepresented founders in less traditionally tech-heavy regions of the country. Businesses would be able to invest in these programs as well, and the combined funding would seed new growth in the startup space. This type of legislation would increase startup diversity and development, while also creating a self-sustaining program that would allow the federal government's financial returns to be reinvested in future startups.

¹⁰⁴ Engine and others have made similar suggestions in the past. E.g., *Startup-Oriented COI TD-19 Relief Proposals*, *supra* note 87, at 4.
¹⁰⁵ *Id.* at 1-2.

Startup Testimonial:

“Not only do Black and Brown founders and women founders face these challenges, but founders allocated outside of Silicon Valley face similar investment issues as well. So there’s an opportunity to have the government partner with venture capital to ensure that those dollars are available, and also ensure that entrepreneurs who come from underrepresented communities or outside of Silicon Valley have the ability to build and grow their companies.”¹⁰⁶

Establishing Tax Credits for Investors Who Make Qualified Investments.

Startups, and underrepresented founders in particular, have unique expenses and challenges. Encouraging investors to make productive investments to diversify innovation should be a priority. For example, some states have angel investor tax credits through which the government offers tax breaks to individuals that make qualifying investments. To subsidize private investment in underrepresented founders, Congress should enact a federal tax program which would allow angel investors a credit of the amount they invested in a startup launched by an underrepresented founder (e.g., new investments in recently established businesses with a tech-focus and with underrepresented founders of color or women founders).¹⁰⁷ To take another example, the PROGRESS Act would create an angel investor tax credit that would offer greater incentive to invest, including in women-owned small businesses.¹⁰⁸ Similarly, Opportunity Zones could be reformed to include more areas and attract more funding to a more diverse array of communities.¹⁰⁹

¹⁰⁶ Graham, *Film Comm*, *supra* note 64.

¹⁰⁷ *Id.* at 3.

¹⁰⁸ Wyden, *Capital Access Bill*, *supra* note 100.

¹⁰⁹ *Startups-Oriented COI TD-19 Relief Proposals*, *supra* note 87, at 3; see also Joe Gove, *Despite Challenges, Opportunity Zones Provide Much-Needed Capital*, *N.Y. Times* (Nov. 24, 2020), <https://www.nytimes.com/2020/11/24/business/opportunity-zones-funding-development.html>.

ACCESS TO CAPITAL

Opening Up More Alternatives.

The federal government should also engage with traditional and newer forms of startup financing to get more innovations into the market. Crowdfunding and fintech solutions offer some promise as viable alternatives for startup financing. Engine encourages the Biden-Harris Administration to ensure that a recent rule change that would allow startups to raise more crowdfunding in a given year goes into effect.¹¹⁰

Exploring alternatives to credit scores.

The current credit score system is a serious barrier to an underserved founder's ability to access capital, and is in serious need of reform. As noted above, in general, underrepresented founders have lower credit scores than white male founders. However, credit scores present a chicken-or-the-egg problem: you need a higher credit score to get more capital, but you need a longer credit history to get a higher credit score. And it is often not a good measure of whether a borrower can and will repay a loan. In addition, the banking system has played an important part in preventing Black Americans from building wealth, such as through historical redlining and ongoing discrepancies in mortgage lending. Because rental payments are not counted in many credit histories, inequitable access to housing also contributes to lower credit scores.¹¹¹

Alternative credit scoring could use a borrower's ability to pay by measuring other inputs, including rental payments, occupations, cell phone payments, checking account information and shopping history. Such scoring, according to community leader, entrepreneur, investor, and professor Melissa Bradley, could play a meaningful role in ameliorating systemic inequities in the financial system.¹¹² Engine encourages the Biden-Harris Administration to continue its early efforts to develop alternatives to the current credit scoring system, such as pushing the Consumer Financial

Protection Bureau to work with existing credit agencies to create and disseminate an alternative.¹¹³

And alongside proposals like the New Business Preservation Act, the federal government should promote the development of more community development financial institutions—with enhanced funding—as well as women-, Black-, and Latino-owned banks. Rectifying inequities in the financial system requires diversifying the financial sector, and the Biden-Harris Administration should join newer efforts from major financial institutions and venture capital firms to achieve that goal.¹¹⁴ Underrepresented innovators need a whole of government approach to realize their financial dreams and grow.

¹¹⁰ See JD Moïs, *Presidential Action Taken by Biden Administration May Delay Investment Crowdfunding Improvements*, Crowdfund Insider (Jan. 22, 2021), <https://www.crowdfundinsider.com/2021/01/171487-presidential-action-taken-by-biden-administration-may-delay-investment-crowdfunding-improvements/>.

¹¹¹ Michelle Singletary, *Credit Scores Are Supposed to Be Race-Neutral. That's Impossible*, Wash. Post: Personal Fin. (Oct. 16, 2020), <https://www.washingtonpost.com/business/2020/10/16/how-race-affects-your-credit-score/>.

¹¹² Melissa L. Bradley, *Expanding Credit through Alternative Credit Scores*, Medium (Oct. 21, 2020), https://medium.com/@melissa_6316/expanding-credit-through-alternative-credit-scores-f015c4e5a29.

¹¹³ See Andrew Ackerman & Orla McCaffrey, *Banks Brace for Tougher Rules Under Biden on Consumer Protection, Fair Lending*, Wall St. J. (Jan. 30, 2021), <https://www.wsj.com/articles/banks-brace-for-tougher-rules-under-biden-on-consumer-protection-fair-lending-11612022400>.

¹¹⁴ See Ryan Williams, *Opinion: Investing in Black-Owned Banks Key to Ending Racial Disparities*, CNBC (Oct. 14, 2020), <https://www.cnbc.com/2020/10/14/opinion-investing-in-black-owned-banks-key-to-ending-racial-disparities.html>; Jeffrey McKinney, *GE Hires First Black Investment Banker in \$2.5 Billion Bond Issuance*, Black Enterprise (Jan. 29, 2021), <https://www.blackenterprise.com/cti-hires-four-black-investment-banks-to-disburse-2.5-billion-bond-issuance/>; Emily Bimbaum, *Inside Tech's Efforts to Invest in Black Banks*, Protocol (Dec. 21, 2020), <https://www.protocol.com/tech-investing-black-owned-banks>.

NETWORKING & MENTORING

Networking and mentoring are crucial to every startup—and underrepresented innovators are no exception. But underrepresented innovators and entrepreneurs have been historically excluded from many of these opportunities. The government can and should do more to establish and foster links between entrepreneurs and investors, between entrepreneurs and industry advisors, and between similarly situated entrepreneurs.¹¹⁵

Startup Testimonial:

*"This is not just about underrepresented entrepreneurs, but also about broadening the entire ecosystem by being more inclusive when it comes to leadership, mentors, advisors, investors, and talent. Underrepresented founders and women are not in the same networks as traditional white male entrepreneurs, so they were not getting that same access. How do you learn from startup failures and successes if you're not even talking to the people who have done it? So we wanted to almost force our way into the existing startup ecosystem and say, 'We are here, and we're going to be here.' Great ideas are not limited to a certain race or gender. Nor are they determined by zip codes."*¹¹⁶

¹¹⁵ Cindy Foy-Uhlir, founder and CEO of Fierce Female Founders in North Carolina, summarizes it well: "When I work with [underrepresented] entrepreneurs, there are three consistent issues that they all face. They're not sure about the right next steps if they want to scale, they lack a network of other [underrepresented] entrepreneurs that understand what they're going through, and they lack access to capital." Eric Saunpel, *Creating New Opportunities for Women*, Engine (Aug. 14, 2020), <https://www.engine.is/news/startupseverywhere-raleigh-nc-fierce-female-founders> [hereinafter "Fierce Female Founders"].

¹¹⁶ Edward Graham, *Driving Entrepreneurial Innovation Through Diversity, Equity, and Inclusion*, Engine (June 19, 2020), <https://www.engine.is/news/startupseverywhere-austin-divinc> (quoting Preston L. James, II, co-founder and CEO of DivInc in Texas).

Community is critical for startup success, and underrepresented innovators often lack access.

Investors

Access to networks is often a critical component of access to capital, as investors traditionally source investment opportunities from their own networks or rely on introductions from people they already know.¹¹⁷ And both VCs and founders have historically backed or hired people from within networks that tend to consist of people with similar views and life experiences.¹¹⁸ Geography is also key, with over 40 percent of VC investment concentrated in Silicon Valley.¹¹⁹

This means, for example, people of color, women, and geographically diverse entrepreneurs often lack the connections needed to get in the room with angel investors and VC firms. Several underrepresented founders in Engine's network have faced these barriers; their stories highlight the importance of networks as critical to raising capital. For example, Bernard Worthy, co-founder and CEO of LoanWell in North Carolina, describes how "[c]ommunity and connections are so important" to connecting "business[es] to big companies and [venture capitalists]."¹²⁰ When underrepresented entrepreneurs lack connections to funding networks, they struggle to gain needed investments. It is not that funding is unavailable generally, as noted by Thiksha Sanogo, founder and CEO of MyTask in Alabama; it is that underrepresented innovators do not have access to the "paths and avenues to capture that [funding]."¹²¹

¹¹⁷ See *Beyond the VC Funding Gap*, Morgan Stanley (Oct. 23, 2010), <https://www.morganstanley.com/ideas/venture-capital-funding-gap>.
¹¹⁸ *Diversity in U.S. Startups*, RaceMyInvestor (2020), available at https://racemyinvestor.com/pdfs/fullfile%2FDiversityVCReport_Final.pdf.
¹¹⁹ *Id.*

¹²⁰ Abby River, *Platform Help Streamline Loan Origination and Servicing Process for Community Lenders*, Engine (Dec. 18, 2020), <https://www.engine.is/news/startupseverywhere-durham-nc-loanwell> [hereinafter "Loanwell"].

¹²¹ Edward Graham, *A New Tool to Help People Plan*, Engine (Jan. 17, 2020), <https://www.engine.is/news/startupseverywhere-duplin-als> (quoting Thiksha Sanogo, Founder and CEO of MyTask in Alabama) [hereinafter "MyTask"].



NETWORKING & MENTORING

Startup Testimonial:

*On the connection between networks and access to capital: “[A] lot of funding that happens in this area is based on relationships. A lot of white entrepreneurs that are building startups already have those networks and connections. . . . Programs to implement tax incentives for angel investors could work in a way that bypasses some of the problems associated with other private funding programs. I think a program that adds a lot of incentives for angels to make investments in underserved communities could actually work.”*¹²²

The lack of diversity in existing startup networks and communities can easily become a cyclical problem, with the same types of people from the same universities and regions of the country invited into the same rooms. Part of solving the problem must come from the networks themselves, with investors thinking differently and diversifying their own ranks. But the government can incentivize the expansion of these networks.

Advisors

Beyond networks for funding, all entrepreneurs need experienced industry advisors to mentor them as they grow their companies.¹²³ Industry advisors provide inside know-how on transforming an idea into a flourishing startup,¹²⁴ offer outside perspective to inform business decisions, and help founders work through thorny issues, develop industry connections, and meet potential customers. This mentorship not only empowers underrepresented innovators to grow their businesses, but it also facilitates connections between

¹²² Graham, *Postscript*, *supra* note 65.

¹²³ Rieft Morris, *Mentors Are the Secret Weapons of Successful Startups*, TechCrunch (Mar. 22, 2015), <https://techcrunch.com/2015/03/22/mentors-are-the-secret-weapons-of-successful-startups/>.

¹²⁴ See Edward Graham, *A Platform to Help Professionals of Color Make Informed Career Choices*, Engine (June 12, 2020), <https://www.engine.is/news/startupseverywhere-nyc-dipper> (“Having advisors who can talk about how to scale and have a network of founders is really key, because some professionals of color might not have that network and might be starting from scratch.” (quoting Neta Jenkins, co-founder of Dipper in New York)).



entrepreneurs and other industry actors, synergistically expanding networks beyond advisors to investors and similar entrepreneurs.¹²⁵

Similarly Situated Entrepreneurs

Networks between similarly situated entrepreneurial peers are also critically important, not only as a source of information but also as a source of community. Bernard Worthy of LoanWell highlights that founders at a common stage learn from one another about “the menu of options for next steps.”¹²⁶ And, as Jake Soberal—co-founder and co-CEO of Bitwise in California—indicates, connecting innovators with “similar backgrounds . . . make[s] them feel safe and welcome.”¹²⁷ This sense of community allows underrepresented founders the space to be free of pressure “to prove that they deserve” to exist and expand their businesses.¹²⁸ These communities then become “sacred space[s] to offer organic and authentic connection[s]” to others who “understand what they’re going through.”¹²⁹ The ability to learn from and grow alongside of similarly situated entrepreneurs in turn can help foster networks for new generations of startup founders.

Startup Testimonial:

*On the importance of connecting underrepresented founders to one another: “A diverse, online community can give you more feedback to help you make your decisions. And the beauty of the online community is that it can transcend geography, so that a founder in a small county in North Carolina can connect to larger networks in Raleigh or Charlotte. Similarly, if I can find someone in an online community who looks like me and landed a big sales deal, then it is easy to ask them about how they landed the deal and what the experience of being the only Black person in the room was like for them.”*¹³⁰

¹²⁵ See, e.g., Graham, *Infiltration*, *supra* note 12 (“Google for Startups . . . empowered us with so much information and I have been able to connect with so many other people. Google opened their rolodex up to us. . . . I’ve already been able to take what I’ve learned from the program to help out other entrepreneurs in our network.” (quoting Chastity Wright, founder and CEO of Infiltrate in Georgia)).

¹²⁶ Rives, *LoanWell*, *supra* note 120.

¹²⁷ *Activating Tech Workers in Underserved and Overlooked Communities*, Engine (Jan. 8, 2021), <https://www.engine.is/news/startupseverywhere-fresno-calif-bitwise> [hereinafter “Bitwise”].

¹²⁸ Edward Graham, *A Search Engine for Colors*, Engine (Feb. 28, 2020), <https://www.engine.is/news/startupseverywhere-charlotte-north-carolina> (quoting Samantha Smith, founder and CEO of Vision in North Carolina) [hereinafter “Vision”].

¹²⁹ Sampsel, *Pierre Formis Founders*, *supra* note 115.

¹³⁰ Rives, *LoanWell*, *supra* note 120.

NETWORKING & MENTORING

Startup Testimonial:

"I wanted to ensure that there was equal representation on the panels and within the actual audience, and what that really takes is just reaching out and inviting people. Women want to see other women in the room, because they assume if other women are there that it's a safe environment where they have the ability to act like themselves and don't have to prove that they deserve to be there."¹³¹

Facilitating and funding networking and mentoring programs for underrepresented founders.

To help address inequities in innovation ecosystems and ensure underrepresented founders are connected to robust networking and mentorship opportunities, the federal government should take an active role in promoting and financing local and national initiatives that foster diverse businesses. While many of these connections traditionally occur face-to-face, enabling networking through online platforms can also expand access, particularly for those in remote or rural communities, and would encourage connections without limitations inherent in geography-based networking events.

Funding

The federal government should increase and direct funding to develop networks between and among underrepresented innovators. Specifically, incubators and accelerators in underserved communities, whose stated goal is to create connections for entrepreneurs within their own communities, are uniquely situated to address the entrepreneurial needs of the startups they serve and could benefit from increased access to federal resources, including grants. For example, Arrowhead Center in New Mexico features an accelerator program for underserved entrepreneurs in the state. The Center connects these entrepreneurs with networks of experts so that the entrepreneurs can access the resources they need to establish and grow their businesses.¹³²

¹³¹ Graham, *Fusion*, page 128 (quoting Samantha Smith, founder and CEO of Vision in North Carolina).

¹³² Edward Graham, *Helping Entrepreneurs Thrive Again New Mexico*, Engine (Apr. 12, 2019), <https://www.engine.is/news/category/startupseverywhere-las-croces-nm> [hereinafter "Arrowhead Center"].

Startup Testimonial:

On the importance of looking to local incubators and accelerators: "We [] have a business incubator that is focused on developing a peer community. A lot of business owners or entrepreneurs feel very isolated. There are no words in Navajo for the concept of entrepreneur or business, and people who are engaged in business activity feel like it's another world and separate from our Native American identity. But Native people have been artisans and traders and sellers as long as we have existed. Unfortunately, there is a lot of negative connotation associated with the concepts of business and entrepreneurship, so people who run businesses are always straddling a fine line where they have to almost ask for permission to start a business. Our incubator is trying to create new narratives and help people connect with their peers."¹³³

Startup Testimonial:

"It is important to invest in entrepreneurs of color and women though without the programming or infrastructure to support them, the impact will not be measurable. For a successful outcome, in addition to providing financial support to entrepreneurs, the funding for economic development should include programming and support to fund the ecosystem builders, like In3."¹³⁴

¹³³ Edward Graham, *Supporting the Growth and Development of Native Entrepreneurs*, Engine (Oct. 19, 2020), <https://www.engine.is/news/startupseverywhere-tuba-city-azie-change-labs> (quoting Heather Fleming, co-founder and executive director of Change Labs in Arizona).

¹³⁴ Edward Graham, *Supporting Black and Underrepresented Entrepreneurs in the District*, Engine (July 2, 2020), <https://www.engine.is/news/startupseverywhere-de-in3> (quoting Aaron Saunders, CEO of the Inclusive Innovation Incubator).

NETWORKING & MENTORING

Building on Pre-Existing Initiatives

Federal entities can also bolster pre-existing initiatives targeted at supporting underrepresented innovators so that the programs are situated to provide networking and mentorship opportunities. For its part, the Small Business Administration should work to hire and retain more diverse staff, especially in its regional offices, ensure regional offices receive and distribute resources equitably to their geographic regions, and focus on programs targeted at underrepresented entrepreneurs like the 8(a) Business Development Program.¹³⁵

Startup Testimonial:

On the importance of building initiatives in local innovation ecosystems: "Policy leaders and government institutions have a unique ability to convene and coordinate. For us, it would be incredibly impactful if policy leaders would use this power to develop a strategic vision for the future of innovation to improve economic development and job creation in Baltimore, as well as the rest of the state. Specifically in Baltimore, officials could use their strength as conveners to establish a coordinating position or entity solely focused on bolstering the ecosystem."¹³⁶

Taking a More Active Approach to Outreach

Federal actors cannot expect that underrepresented innovators will easily find them. The government needs to both actively seek out diverse entrepreneurs and also improve the accessibility of government resources. To be sure, this requires intentionality and thus considerable time and effort, but it is necessary to ensure that government resources and programs are more likely to be discovered and used by those for whom they are intended.

There are at least two specific ways the government can facilitate direct outreach: first, government entities should make it easier for

¹³⁵ See *Minority Owned*, U.S. Small Bus. Admin., <https://www.sba.gov/category/business-groups/minority-owned> (last visited Jan. 28, 2021).

¹³⁶ Emma Peck, *#StartupsEverywhere: Darius Graham* (Baltimore, MD), Engine (Mar. 2, 2017), <https://www.engine.is/news/category/startups-everywhere-darius-graham-baltimore-md> (quoting Darius Graham, director of the Social Innovation Lab at Johns Hopkins University).

¹³⁷ Sampsel, *Fierce Female Founders*, *supra* note 115.

underrepresented businesses to register as, for example, person-of-color- or woman-owned. As described by Candy of Fierce Female Founders, bureaucratic hoops and complicated paperwork can make it difficult to register as an underrepresented entrepreneur, which in turn makes it difficult to access dedicated resources.¹³⁷ Reducing barriers to the registration process would also provide local government and private startup services with better information about where to direct resources.¹³⁸ Additionally, it can encourage advising and peer networks by more easily identifying similarly situated startups.¹³⁹

Second, the government should show up—literally. Underrepresented entrepreneurs organize and attend conferences, where government representatives are often able to participate;¹⁴⁰ and they should seek to do so and bring resources in hand. Whether it be giving out pamphlets at an information booth, delivering remarks, or just listening to what founders need (but ideally all of the above), federal agencies should be present where the founders are, proactively highlight government programs, and hear directly about what startups need to advance their businesses.

Startup Testimonial:

"I just finished with a women's entrepreneurship conference last week. We had about 130 female entrepreneurs come in . . . It was our third annual conference, and it was a really fantastic opportunity for female entrepreneurs to network, get inspired and empowered, and actually walk away with the tools and resources they need to start a venture."¹⁴¹

¹³⁸ See Graham, *Arrowhead Center*, *supra* note 132 ("I'm also launching . . . an open list of female entrepreneurs in New Mexico, and I'm going to share this with economic development organizations, entrepreneurship development organizations, and others who are in charge of running entrepreneurship or startup-based programs or services. . . . [S]o there are essentially no excuses for not having equal representation." (quoting Zeidi Ruyyan Sloan of Arrowhead Center)).

¹³⁹ See Rives, *LeanWell*, *supra* note 120 ("[T]here are efficiencies that can come from companies at a similar stage who would benefit from common advising, professional services, and counsel." (quoting Bernard Wardly of LeanWell)).

¹⁴⁰ See, e.g., Graham, *Y-Zion*, *supra* note 128 ("I initially created Collective Hustle[, a Charlotte-based investor and startup coalition] to be a monthly meet-up, with the goal of having panels of investors and founders tackling a specific topic. I wanted to ensure that there was equal representation on the panels and within the actual audience, and what that really takes is just reaching out and inviting people." (quoting Samantha Smith of Vision)).

¹⁴¹ Graham, *Arrowhead Center*, *supra* note 132 (quoting Zeidi Ruyyan Sloan of Arrowhead Center).

NETWORKING & MENTORING

Startup Testimonial:

On the importance of the government showing up: "Your network is your net worth. It doesn't help if you're not exposed to officials. I've written many of them and invited them to many things, but they're just not coming, and I don't know how else to get their attention."¹⁴²

Including Online Resources and Ways to Connect

But resources, like funding and networking opportunities, should not be confined to the physical world—they should be expanded to online formats. Online resources offer meaningful benefits in that they are not bounded by geography, and they can provide breadth and depth of advising opportunities. Organizations serving underrepresented founders describe these benefits after moving their own initiatives online in light of the COVID-19 pandemic. Online platforms reach everywhere, from urban to rural entrepreneurs.¹⁴³ And online resources connect underrepresented innovators with perspectives beyond a single mentor: "If a company only has one mentor, that's only one person's advice. A diverse, online community can give you more feedback to help you make your decisions."¹⁴⁴

Startup Testimonial:

"We are also very intentional about bringing people together and organizing conversations, because innovation and businesses often start with just a conversation. We invite a lot of people—now virtually—to share their stories with us and connect with other entrepreneurs. Oftentimes, these conversations help new projects come together and new teams form and new product ideas emerge."¹⁴⁵

¹⁴² Graham, *MyTash*, *supra* note 121 (quoting Tikisha Samogo of MyTash).

¹⁴³ Sampsel, *Fierce Female Founders*, *supra* note 115 ("We pivoted by taking our programs online. The advantages we have seen is that in going virtual we are no longer bound by geography. It has opened us up to be able to serve women everywhere" (quoting Cindy Foy-Ullie of Fierce Female Founders)).

¹⁴⁴ Rives, *LeanWell*, *supra* note 120 (quoting Bernard Worthy of LeanWell).

Startup Testimonial:

On the importance of online resources for rural entrepreneurs: "[Arrowhead Center's] focus for the last few years has been dedicated to building out a program that is accessible to underserved entrepreneurs. . . . We're doing that by building a system-wide network of accelerator programs that are offered virtually. And we're using a shared-economy model—leveraging the resources and expertise of individuals in various rural communities across New Mexico—to provide access to a robust network of experts and technical assistance providers. We have about 40 mentors that are available to anyone who participates in this program. The accelerator programs are called 'sprints' and they vary in length and industry focus. They're unique in that the virtual format really opens the door for entrepreneurs who would've otherwise not been able to participate."¹⁴⁶

Supporting Equity in All Professions

The community surrounding a startup founder is bigger than investors, mentors, and colleagues—entrepreneurs must also turn to experts for other services like legal advice and accounting. Building diversity in those pipelines is also critical so that underrepresented founders can turn to professionals that bring similarly diverse and unique perspectives. The ability to readily hire a Black woman patent lawyer, for example, will help build trust and facilitate successful applications for high-quality patents by Black women inventors. The same is true for services across the innovation sector.

¹⁴⁵ Edward Graham, *Support Entrepreneurial Success in the Borderlands*, *Engine* (Sept. 18, 2020), <https://www.engine.is/news/startupeverywhere-el-paso-tecas-pioneers-21> (quoting Carlos Martinez-Vela, Executive Director of Pioneers 21).

¹⁴⁶ Graham, *Arrowhead Center*, *supra* note 132 (quoting Zetdi Runyan Sloan of Arrowhead Center).

EDUCATION & TRAINING

While improving access to capital and expanding networks for underrepresented entrepreneurs may yield more near-term results, federal entities should also improve education opportunities for underrepresented innovators so that they are equitable and inclusive, affecting long-lasting change. This includes improving access to science, technology, engineering, and mathematics (STEM) education, but it also applies to business and innovation and entrepreneurship (I&E) education and training for underrepresented students. Greater access and retention is critical because the nation needs diverse students in the talent pipeline. In order to achieve that goal, diversity of STEM, business, and I&E educators is also critical but often overlooked.

Diversity gaps among students and educators.

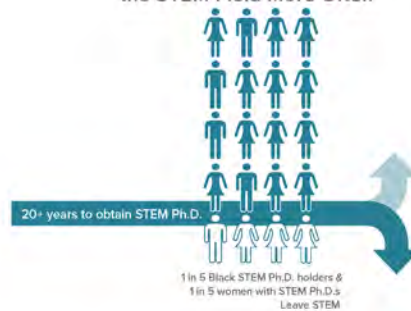
Retention of Students in Innovation Careers

The nation's innovation ecosystems need high-skilled, diverse talent. In order to grow and sustain diversity in innovation, the government should invest in a diverse talent pipeline because, beyond funding, building a team is one of the biggest challenges facing startups. A successful talent pipeline not only starts early to excite young students about innovation, but it also requires encouraging talented students to channel that excitement into innovation careers.

Disparities in education representation are compounded by problems of retention, which cuts off the innovation pipeline too early for students who cannot or do not want to pursue innovation careers. Students of color represent 38.5 percent of STEM postsecondary students,¹⁴⁷ but Black and Latino students switch out of STEM degree programs at higher rates than their white peers.¹⁴⁸ In addition, an estimated 20 percent of Black STEM

Ph.D. holders and 20 percent of women STEM Ph.D. holders leave STEM fields.¹⁴⁹ And the retention problems only continue, creating further underrepresentation in the workplace: of all STEM professionals, only 9 percent are Black and only 7 percent are Latino.¹⁵⁰

Women and Black Ph.D. Holders Leave the STEM Field More Often



Beyond a lack of representation in STEM fields, taking a closer view—and acknowledging that not all STEM jobs are created equal—reveals other relevant disparities across STEM fields. For example, computer jobs feature one of the highest median earnings of any STEM field, but the computer workforce is only 14 percent Black or Latino and only 25 percent women.¹⁵¹ On the other end of the salary median are healthcare practitioners and technicians.¹⁵² And it is these lower paying fields that have the highest representation of Black, Latino, and women workers. By way of example, 37 percent of licensed nurses are Black or Latino as are about a quarter of health support, medical record, and clinical laboratory technicians.¹⁵³ Women, on the other hand, comprise 75 percent of healthcare practitioners and technicians.¹⁵⁴

¹⁴⁷ Nat'l Ctr. For Educ. Stat., *Table 318.45*, Dig. Educ. Stat. (Oct. 2019), https://nces.ed.gov/ipeds/data/digest/tables/d19_318.45.asp (2017-2018 percentages).

¹⁴⁸ Emily Aronin, *A Third of Minority Students Leave STEM Majors*, *HerO's W'ly*, EAB (Oct. 8, 2019), <https://eab.com/insights/daily-briefing/student-success/a-third-of-minority-students-leave-stem-majors-heres-why/>; see also Univ. of Ill. Coll. of Agric., Consumer & Env't Scis., *Racial Microaggressions Contribute to Disparities in STEM Education*, ScienceDaily (Dec. 8, 2020), <https://www.sciencedaily.com/releases/2020/12/201208111636.htm>.

¹⁴⁹ See Carol O'Donnell & Stefania Ruffinone, *An Integrated Approach to Diversity, Equity, Accessibility and Inclusion (DEAI) in STEM*, Smithsonian Sci. & Educ. Ctr. (2019), available at https://sec.siedu/sites/default/files/other/STEM_leadership_Alliance2020.pdf.

¹⁵⁰ Cary Fink & Kim Parker, *Women and Men in STEM: Office at Odds*, *Our Workplace Equity*, Pew Resch. Ctr. 8 (Jan. 9, 2018), https://www.pewresearch.org/social-trends/wp-content/uploads/sites/3/2018/01/PS_2018.01.09_STEM_FINAL.pdf.

¹⁵¹ *Id.* at 16, 34, 36.

¹⁵² *Id.*

¹⁵³ *Id.* at 34.

¹⁵⁴ *Id.* at 30.

EDUCATION & TRAINING

Understanding STEM's "leaky pipeline," and ensuring that underrepresented innovators are inspired and able to pursue lucrative careers, will require further data collection, and Engine encourages NCEAL to call for that. But anecdotal evidence suggests that disparate access to education, lack of encouragement at an early age, discrimination, difficulty balancing work and family, and lack of representation are barriers to entering STEM jobs for underrepresented innovators of color and women innovators.¹⁵⁵

It is also important to note that fostering STEM jobs should be inclusive of those positions that do not require postsecondary education. Innovation does not require a degree, so inquiry into innovation retention should not focus on only advanced education-related factors. For example, alternative education like immersion programs or "boot camps" can be another successful path to STEM and innovation careers.¹⁵⁶

Finally, in addressing retention, geography is another important factor: innovation industries, talent, and jobs cluster in a few cities.¹⁵⁷ And rural communities that may be successful at turning out students interested in STEM tend to lose talent to other regions upon graduation. Indeed, some entrepreneurs looking to launch companies outside those traditional tech sectors face pressure to relocate so that they can connect with investors and talent.¹⁵⁸

Startup Testimonial:

On Missoula's startup ecosystem: "Our number one challenge right now is continuing to fuel the talent pipeline. When I first moved here, Montana's biggest export was its talent, we used to lose a lot of people to big cities and traditional hubs. What we're going through now is trying to help the students coming through our universities understand that there are great career opportunities here. We are also trying to get the word out to Montanans who have left here and want to come back that the opportunities with successful companies exist."¹⁵⁹

¹⁵⁵ *Id.* at 21.

¹⁵⁶ For a discussion of some alternative pathways to STEM education and STEM careers, see Joe Alper, *Developing a National STEM Workforce Strategy: A Workshop Summary*, Nat'l Acads. 63-70 (2016), available at <https://www.nap.edu/read/21990/chapter/8>.

¹⁵⁷ Eduardo Porter, *A Few Cities Have Cornered Innovation Jobs. Can That Be Changed?*, N.Y. Times (Dec. 9, 2019), <https://www.nytimes.com/2019/12/09/business/economy/innovation-jobs-cities.html>.

¹⁵⁸ Nathan Lindfors, *Cultivating a Marketplace for Farmers Using Technology*, Engine (Nov. 24, 2020), <https://www.engine.is/news/startupeverywhere-midwest-kau-hilchpin> (interviewing Trevor McKeeman, CEO of HilchPin in Kansas).

¹⁵⁹ Andrew Jones, *#StartupsEverywhere: Missoula, MT*, Engine (Mar. 26, 2018), <https://www.engine.is/news/category/startupeverywhere>.

Startup Testimonial:

On Effingham's startup ecosystem: "[T]he hardest part about staying in a rural community, especially when you leave high school and go to college, is not understanding or knowing what the local opportunities are. It would be great to have a program funded by the government, at the high school level, that allows local companies to engage with students. For students at Effingham High School, it would be great to educate them about the local job opportunities as part of career development. If students going from high school to college don't know about their local opportunities or companies, then they won't come back because they don't know that there are good jobs for them in rural communities."¹⁶⁰

Innovation Educators

To better encourage and foster diversity in innovation, the government should invest in underrepresented STEM and business educators as well as students.

The diversity of educators matters because representation matters.¹⁶¹ The opportunity for students to identify themselves in their educators instills the belief in students that they, too,

missoula-mt (interviewing Paul Gladen, director of Blackstone Launchpad at the University of Montana).

¹⁶⁰ Edward Graham, *Streamlining Average Reporting Solutions for Farmers*, Engine (Aug. 28, 2020), <https://www.engine.is/news/startupeverywhere-effingham-ill-nyagdata> (quoting Deb Casarella, co-founder and CEO of MyAgData in Illinois).

¹⁶¹ The same is true in fields other than education. Lack of representation leads to additional inequalities and exacerbates existing ones. This is well-documented in medicine, where Black patients face more adverse outcomes when treated by white doctors than when treated by Black doctors. See, e.g., Erin Delton et al., *A Systematic Review of the Impact of Physician Racial Bias on Clinical Decision Making*, 24 *Acad. Emergency Med.* 895 (2017); Nat'l Acads., *Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care* 3-12, 19 (Brian D. Smedley, Adrienne Y. Smith, & Alan R. Nelson eds., 2003); see also Talia Milgrom-Ellcott, *Students of Color Are Missing Out on STEM Opportunities. So the Planet Is Missing Out on Their Brilliance. Here's How We Finally Achieve Equity in High School STEM*, Forbes (Sept. 24, 2020), <https://www.forbes.com/sites/taliaimilgromelcott/2020/09/24/students-of-color-are-missing-out-on-stem-opportunities-so-the-planet-is-missing-out-on-their-brilliance-heres-how-we-finally-achieve-equity-in-high-school-stem/?sh=52c6a28c5148> (making the connection between the effects of representation in medicine and in education).

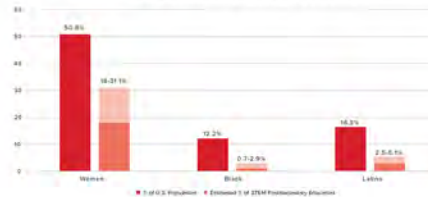
EDUCATION & TRAINING

belong as innovators.¹⁶² This is due, at least in part, to role model effects and cultural understanding. Diverse educators serve as role models and signal to underrepresented students that they have a future in STEM, innovation, and entrepreneurship.¹⁶³ Additionally, cultural understanding between educators and students helps ensure that material is explained in a “culturally relevant and engaging way.”¹⁶⁴ As one expert describes the effects, “[a] diverse staff allows more students to see themselves in their teachers, school leaders, and other school personnel . . . [and] provides more opportunities for students to find someone they can connect with, whether through shared culture or other experiences.”¹⁶⁵

Representation in education is essential because it encourages more underrepresented students to choose a career of innovation and entrepreneurship. Early exposure to inclusive innovation education excites and motivates students to pursue STEM, business, and innovation higher education, and from there, careers. As Irma Olguin Jr, co-founder and co-CEO of Bitwise, explains, joining an innovation ecosystem “shouldn’t be an unfathomable option[] or an accident for anyone.”¹⁶⁶

Unfortunately, the educator workforce is less diverse than the population. STEM and business education begins far earlier than college,¹⁶⁷ so the government should start by looking at educators

Underrepresented Groups in STEM Education, Compared to Representation in U.S. Population



in primary and secondary schools, where a recent report by the Department of Education found that only 18 percent of educators were people of color,¹⁶⁸ while over the same time, 36 percent of the population identified as people of color.¹⁶⁹

The same is true for postsecondary educators. Only 24 percent of university faculty members in the U.S. are people of color.¹⁷⁰ And across STEM fields, the statistics are even bleaker. According to a 2017 study, 12.2 percent of the population is Black, but only 0.7 to 2.9 percent of STEM faculty are Black.¹⁷¹ And while 16.3 percent of the population is Latino, between 2.5 to 5.1 percent of postsecondary STEM faculty identify as such.¹⁷² Gender parity is likewise absent, with only 18 to 31.1 percent STEM postsecondary educators identifying as women despite comprising 50.8 percent of the population.¹⁷³

early as preschool); Andrew Jones, #StartupsEverywhere: Kansas City, MO, Engue (May 15, 2018), <https://www.engue.is/news/category/startupseverywhere-kansas-city-mo?eq=Missouri> (interviewing Ryan Weber, president of the KC Tech Council in Missouri, who notes the disparity in computer science education across schools in Missouri).

¹⁶⁸ U.S. Dep’t of Educ., The State of Racial Diversity in the Educator Workforce at 3, 6 (July 2016), available at <https://www2.ed.gov/eschstat/eval/highered/racial-diversity/state-racial-diversity-workforce.pdf>.

¹⁶⁹ Stephanie Ewart, U.S. Population Trends: 2000 to 2060, U.S. Census Bureau at 7 (Oct. 15, 2015), available at <https://www.census.gov/Portals/1/Documents/nalfo/USDemographics.pdf>.

¹⁷⁰ Leslie Davis & Richard Fry, College Faculty Have Become More Racially and Ethnically Diverse, But Remain Far Less So Than Students, Pew Resch. Ctr. (July 31, 2019), <https://www.pewresearch.org/fact-tank/2019/07/31/college-faculty-student-diversity/>.

¹⁷¹ Diyi Li & Cory Koedel, Representation and Salary Gaps by Race-Ethnicity and Gender at Selective Public Universities, 46 Educ. Researcher 343, 346, 347 tbl.3 (2017). Note that the Li and Koedel used the 2010 census demographic data in making their comparisons. Demographic data from the 2020 census remains outstanding, but it is expected that the proportion of nonwhite residents has only grown, meaning these data underestimate the disparity in representation.

¹⁷² *Id.*

¹⁷³ *Id.*

¹⁶² See Christopher Redding, *A Teacher Like Me: A Review of the Effect of Student-Teacher Racial/Ethnic Matching on Teacher Perceptions of Students and Student Academic and Behavioral Outcomes*, 89 Rev. Educ. Resch. 499 (2019).

¹⁶³ See Seth Gershenson et al., *The Long-Run Impacts of Same-Race Teachers*, Nat’l Bureau Econ. Resch. (Nov. 2018), available at <https://www.nber.org/papers/w25254>.

¹⁶⁴ See Arna J. Egalite & Brian Kisida, *The Effects of Teacher Match on Students’ Academic Perceptions and Attitudes*, 40 Educ. Evaluation & Pol’y Analysis 59, 75 (2018), see also *Cultivating Native American Entrepreneurship in Northern Michigan*, Engue (Jan. 29, 2021), <https://www.engue.is/news/startupseverywhere-traverse-city-mich-arrowhead-incubator> (interviewing Shiloh Slomsky, executive director and co-founder of Arrowhead Incubator in Michigan, and describing the power of infusing culture into business training for Native American entrepreneurs, like by lecturing in traditional attire).

¹⁶⁵ Daniel A. Domenech, *Here Is Why Diversity in STEM Education Is So Important*, Educ. & Career News, <https://www.educationandcareersnews.com/education-technology/here-is-why-diversity-in-stem-education-is-so-important/> (last visited Feb. 9, 2021) (interviewing and quoting Kendall V. Ali).

¹⁶⁶ *Bitwise*, *supra* note 127.

¹⁶⁷ See Edward Grelham, *Using Technology to Support Child Care Providers*, Engue (Oct. 4, 2019) <https://www.engue.is/news/startupseverywhere-pittsburgh-pa> (interviewing Shamira Williams, co-founder of C.C. Busy in Pennsylvania, who discusses the need to start STEM education as

EDUCATION & TRAINING

Funding STEM and I&E education initiatives for underrepresented students and educators.

To diversify American innovation ecosystems, the government should invest in local and federal programs aimed at improving access to STEM and I&E teaching and education across primary, secondary, and postsecondary levels.

Improving and Expanding Programs for Students.

Access to STEM and I&E education should improve on two axes. First, the government should ensure innovation education resources and programs are available to underrepresented students regardless of race, gender, or geography. This includes access to STEM and I&E educators as well as to innovation and entrepreneurial co-curricular and extracurricular activities. Second, those resources should be presented in ways that are tailored to and engaging for underrepresented students.

Startup Testimonial:

"I worked on a bill to provide funding to STEM organizations that focus on students of color across Georgia's education system. That funding has gone to create STEM clubs across the state. We are hosting targeted workshops, and we are seeing more Black and Latino children engaged with science and math throughout the course of their education. I wanted to be part of this effort to give students opportunities that I did not have at their age. If I had a STEM club in elementary school, then I think I would have been an aerospace engineer a lot earlier in my career."¹⁷⁴

The federal government should invest in programs aimed at expanding and revising STEM and I&E curriculum resources so that innovation education is exciting and inviting to all students. Federal entities can fund and encourage state and local funding of tailored education programs for

¹⁷⁴ Graham, *Infiltration*, *supra* note 12 (quoting Chastity Wright of Infiltrate).



students of all ages—from early childhood to postgraduate education—and highlight contributions of diverse innovators. Additionally, the government should invest in local STEM and I&E co-curricular and extracurricular programs for primary and secondary schools in underserved communities.¹⁷⁵ For postsecondary education, the government should invest in innovation-related clubs at HBCUs, land-grant universities, and other postsecondary education institutions that attract more diverse student bodies, including community colleges.

It is also vital that innovation educators establish inclusive environments.¹⁷⁶ Doing so requires that educators reflect on their own identities and privileges, recognize the multidimensional motivations and aspirations of their students, and highlight STEM and I&E contributions by diverse entrepreneurs.¹⁷⁷ Instead of focusing on only Thomas Edison, for example, the works of Percy Julian, Sarah Boone, and Katharine Burr Blodgett also should be center stage.

Increasing Diversity Among Educators.

The government should encourage and invest in efforts to diversify the educator workforce. For example, alternative-route certification programs attract more diverse educators and should be expanded.¹⁷⁸ The government should also increase funding for initiatives like the Smithsonian STEM Education Summit and 100Kin10 that specifically seek to increase diversity in STEM and I&E education.¹⁷⁹ More broadly, the government should build and encourage the narrative that teaching STEM is a viable career path for all, both through explicit programming and through more expansive loan forgiveness.

The government should also take an active role in reaching out to and connecting with potential underrepresented educators.

¹⁷⁵ See, e.g., *Project Invent Fellowship*, Project Invent, <https://projectinvent.org/for-educators> (last visited Jan. 29, 2021); Graham, *Infiltration*, *supra* note 12 (discussing STEM program focusing on students of color across Georgia).

¹⁷⁶ Alison Singer, Georgina Montgomery, & Shannon Schroll, *How to Foster the Formation of STEM Identity: Studying Diversity in an Authentic Learning Environment*, 1st J. STEM Educ. (Nov. 6, 2020), <https://doi.org/10.1186/140594-020-00254-z>.

¹⁷⁷ See Tess L. Killpack & Laverne C. Melton, *Toward Inclusive STEM Classrooms: What Personal Role Do Faculty Play?*, CBE—Life Sci. Educ. (Oct. 13, 2017), <https://www.lifescied.org/doi/full/10.1187/cbe-16-01-0020>.

¹⁷⁸ U.S. Dep't of Educ., *supra* note 168, at 17.

¹⁷⁹ *STEM Education Summit: Building a Coalition for Attracting and Retaining a Diverse STEM Teaching Workforce*, Smithsonian Sci. & Educ. Ctr., <https://ssec.si.edu/event/stem-education-summit-building-coalition-attracting-and-retaining-diverse-stem-teaching> (last visited Jan. 28, 2020); *Our Story*, 100Kin10, <https://100kin10.org/about> (last visited Jan. 28, 2021).

EDUCATION & TRAINING

For example, the Department of Education should actively recruit underrepresented educators to join the STEM and I&E education workforce. Action produces results: as Washington University in St. Louis demonstrated with its practice of solicitation and invitation for its Women in Innovation and Technology program, actively reaching out to underrepresented educators diversifies the innovation educator workforce which in turn provides role models for underrepresented students to see themselves in STEM and I&E.¹⁸⁰

Investing in I&E Education Programs Focused on Underrepresented Innovators.

The government should also look to I&E education as a path to expand American innovation. Innovation and entrepreneurship are often complex and non-linear, and preparing students to succeed requires different educational approaches compared to traditional disciplines.¹⁸¹ Extant I&E programs range from guiding students from an idea to a business or technology launch to focusing further upstream by training students to be more innovative and creative.¹⁸² Indeed, I&E are core skills, and training students to be more innovative should be considered a part of the core curriculum from a young age.¹⁸³

Because I&E programs are often interdisciplinary, attracting

students from across an institution, they can create a natural pull towards diversity. Well-designed I&E programs can encompass students from a broad range of disciplines—engineering, computer science, psychology, sociology, marketing, finance, law, nursing, and more. And in so doing, I&E programs can attract students who may shy away from traditional STEM fields but are interested in learning about innovation.¹⁸⁴

Many I&E programs currently look to private donors¹⁸⁵ and may struggle to compete for traditional government funding because they do not fit tidy STEM definitions. While these private donations add a lot of value, I&E programs reliant on private funds are often targeted to the donor's particular interests and can be difficult to scale. The government should consider establishing dedicated funding pools or issuing specific grant opportunities for I&E education. This would make it easier to expand U.S. innovation and would enable schools that lack a wealthy donor base to launch successful I&E programs. The government could also expand existing programs like NSF's I-CORPS, which is designed to support the commercialization of new technologies and reduce the risk and time required to translate new ideas to the market.¹⁸⁶

Importantly, the government should also identify gaps in diversity for its current I&E investments and develop new, dedicated programs that serve all underrepresented students. Existing I&E education investments provide a start, but they do not fully accomplish this goal. For example, while I-CORPS has made strides broadening participation by women,¹⁸⁷ participation by other underrepresented groups is still lacking.¹⁸⁸ The government should consider establishing additional programs at institutions that attract a more diverse student body, like HBCUs, land-grant universities, and community colleges.

¹⁸⁰ Wash. Univ. in St. Louis, Comment Letter on Request for Comments on the SUCCESS Act of 2018, at 2-3 (June 27, 2019), <https://www.uspto.gov/sites/default/files/documents/SUCCESSAct-Washington-University-in-St-Louis.pdf>.

¹⁸¹ See Gabriel Linton & Markus Klinton, *University Entrepreneurship Education: A Design Thinking Approach to Learning*, *J. Innovation & Entrepreneurship* (Jan. 14, 2019), <https://innovation-entrepreneurship.springeropen.com/articles/10.1186/s13731-018-0098-z>.

¹⁸² See Martin Lackéus, *Entrepreneurship in Education: What, Why, When, How*, *Entrepreneurship360*, at 1 (2015), https://www.oecd.org/cfe/leed/BGP_Entrepreneurship-in-Education.pdf (noting that the definition of entrepreneurship can vary, from training students to start a business to making students more creative). For examples of I&E programs, see Duke Univ., *Education*, *Duke Innovation & Entrepreneurship*, <https://entrepreneurship.duke.edu/education/> (last visited Feb. 12, 2021); Ga. Inst. of Tech., *TIGER Program*, *Ga. Tech. Scheller Coll. Bus.*, <https://www.scheller.gatech.edu/centers-initiatives/tiger/index.html> (last visited Feb. 12, 2021); and Univ. Colo. Colo. Springs, *UCCS Bachelor of Innovation*, <https://innovation.uccs.edu/what-is-the-bi/>. See also U.S. Dep't of Com., *The Innovative and Entrepreneurial University: Higher Education, Innovation & Entrepreneurship in Focus* 10-12 (Oct. 2013), https://www.eida.gov/pdf/The_Innovative_and_Entrepreneurial_University_Report.pdf (listing select programs).

¹⁸³ One model, the Network for Teaching Entrepreneurship (NTE), is an education non-profit focused on bringing entrepreneurship to middle- and high school students, as well as educators, in low-income communities. NTE, *NTE*, <https://www.nfte.com/> (last visited Feb. 18, 2021).

¹⁸⁴ Indeed, the student population of certain I&E programs mirrors the diversity of the entire student population. Compare, e.g., Duke Univ., *Scaling Duke Innovation & Entrepreneurship*, <https://entrepreneurship.duke.edu/ar-2019-2020-scaling/> (last visited Feb. 18, 2021) with Duke Facts, <https://facts.duke.edu/> (last visited Feb. 22, 2021) (I&E students drawn from multiple majors across the university, where the demographic data of the I&E program are highly similar to that of the overall university).

¹⁸⁵ See, e.g., A. James & Alice B. Clark Found., *A. James Clark Scholars Program*, <https://clarkfoundationdc.org/clark-scholars/> (last visited Feb. 11, 2021).

¹⁸⁶ Nat'l Sci. Found., *National Science Foundation Innovation Corps*, https://www.nsf.gov/news/special_reports/i-corps/about.jsp (last visited Feb. 12, 2021).

¹⁸⁷ Nat'l Sci. Found., *Innovation Corps (I-Corps): Biennial Report 13* (Spring 2019), https://www.nsf.gov/news/special_reports/i-corps/pdf/I-CorpsReport-6_4_FINAL_508.pdf.

¹⁸⁸ See *id.* at 26 (noting that, of 1626 individuals, only 453 were from underrepresented groups but 338 of those were women and reporting that only 208 team leads were from underrepresented groups but 164 of those were women); Nat'l Sci. Found., *A National Initiative to Develop Diversity and Inclusion Infrastructure for STEM Innovation*, https://www.nsf.gov/awardsearch/showAward?AWD_ID=1940055 (last visited Feb. 11, 2021).

CONCLUSION

Diversity in innovation is critical. Yet for too long, underrepresented startup founders have faced unfair and unwarranted barriers—erected both intentionally and unintentionally—across the country. And these injustices have also deprived the nation of economic opportunities and great ideas. Engine is thankful NCEAI will take up these vital questions about how to expand American innovation and encourages NCEAI to conduct a thorough, nuanced assessment of the roadblocks underrepresented founders face, as well as suggest creative solutions to start dismantling them. While the USPTO may be limited in what it can do directly, it has a role to play. Importantly, Engine urges the entire federal government to think broadly about what it can do to right past wrongs; create new opportunities through funding and programs to invite more diversity into existing innovation ecosystems, and incentivize private actors to make change.

Thank you for the opportunity to submit these perspectives. Engine is firmly committed to helping grow and support the nation's startup ecosystems, and a substantial part of that work must include promoting diversity and inclusion. Engine is likewise committed to serving as a resource for and engaging with NCEAI, USPTO, and all levels of government on changes that could advance this goal.

Appendix B

February 23, 2021

Jamie Scianna
Office of Governmental Affairs
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313
innovationcomment@uspto.gov

Dear Ms. Scianna,

We applaud the National Council for Expanding American Innovation's ("NCEAI") goal of building more inclusive innovation ecosystems in the U.S. As startups, founders, incubators, accelerators, investors, and support organizations, we know the substantial value of innovation and entrepreneurship. Startups drive American innovation and economic growth, create jobs (the jobs of the future), develop groundbreaking new technology, and launch with novel business models and improved services. But the nation must do more to promote equity in these benefits and opportunities. We are grateful for this opportunity to highlight issues facing underrepresented founders and suggest ways to improve diversity in this sector.

Startup communities across the country comprise individuals of every race, gender, ethnicity, and culture. Embracing and elevating this diversity is crucial. Not only is it the right thing to do—but companies with diverse leaders and teams contribute unique (often better) ideas, can build products that serve a broader customer base, are more profitable, and tend to outperform less diverse companies.¹

But the diversity of America's entrepreneurs and startup founders does not yet reflect the diversity of the people that make up this country. Would-be entrepreneurs with great ideas are being unfairly left behind while we, as a nation, miss out on exciting contributions they could offer. And as the nation continues the necessary work of addressing systemic inequality and structural racism, the government should emphasize improving diversity in innovation and entrepreneurship as one avenue to increase opportunities and create wealth in underserved and historically marginalized communities.

In many ways, the challenges facing underrepresented founders are woven into the fabric of the country. Tackling these problems will require intense focus, dedication, and creativity. We realize the Patent and Trademark Office will be limited in what it can do directly, and resolving inequalities in our innovation ecosystems will be much more complex than patent ownership—indeed, increasing the number of U.S. patents is probably not the answer. Surface-level thinking, or viewing problems only through the lens of patents or inventions, will limit the impact the NCEAI can have. And one-size-fits-all responses will not be the answer—different communities of underrepresented founders face different barriers, and the government should seek to elevate each of these communities with a tailored approach. We urge NCEAI to conduct a deep exploration of the complex barriers underrepresented founders face and propose concrete steps the federal government can take across agencies to support these founders and start to tear down the various barriers. To that end, we are offering a few suggestions:

¹ See, e.g., Sylvia Ann Hewlett et al., *How Diversity Can Drive Innovation*, *Harv. Bus. Rev.* (Dec. 2013). <https://hbr.org/2013/12/how-diversity-can-drive-innovation>; *Tech Experts Share the Importance of Diversity and How to Foster Inclusion*, *Cornell Tech* (Oct. 12, 2017). <https://tech.cornell.edu/news/tech-experts-share-the-importance-of-diversity-and-how-to-foster-inclusion/>

- **Make direct government funding fairer and more equitable.** Accessing capital is often the most significant barrier facing underrepresented founders, and many of us know—firsthand—how difficult it is to raise funds. The government can help fill in the gaps by increasing funding to underrepresented founders with, e.g., existing (or new) loan and grant programs. There is also a need to examine and rectify disparity in federal lending and grantmaking. For example, women and Black loan applicants to the Paycheck Protection Program fared worse than their white, male counterparts.² The government should seek to eliminate bias and increase representation among those deciding who gets funded and ensure the metrics used to evaluate applicants do not reinforce disparities.³
- **Support incubators and accelerators dedicated to diversity and inclusion & replicate successful efforts across the U.S.** Innovation intermediaries are familiar with local startup ecosystems and often best-suited to identify and meet the needs of diverse founders in their communities. These incubators and accelerators can provide critical programming and regional networking opportunities—connections and mentorship that are key to any startup’s success. Indeed, certain funding streams, such as VC, are largely network-dependent. The government should find ways to invest in and through these institutions with a proven track record of working with underrepresented founders and encourage creation of new institutions with targeted expertise to assist unique startups across the U.S.
- **Incentivize private investment in underrepresented founders.** More than 75 percent of VC funding goes to all-white teams.⁴ While, over the past decade, startups led by Latinx women raised only 0.32 percent of all VC funding, and Black women only 0.0006 percent.⁵ These disparities are often self-perpetuating: VCs tend to fund founders with similar life experiences as the investors themselves—those they already know, that went to the same school or live in the same city, that have already made successful exits, etc.⁶ Breaking that cycle will require VCs to start thinking differently and inviting more diverse investors into their ranks. But the federal government can encourage investors to diversify their portfolios. For example, the government could make matching investments when VCs fund companies with diverse founders or offer tax credits to angels who make qualifying investments.
- **Expand access to credit.** Startup founders usually turn to personal savings, credit, and friends and family for funding.⁷ But generational wealth gaps and systemic racism mean that fewer founders of color can tap those resources. And underrepresented founders may be reluctant to pursue bank business loans, fearing their applications will be rejected. The numbers bear this out—for example, Black business loan applicants are rejected 53.4 percent of the time, compared to a 24.7 percent rejection rate for white applicants, and underrepresented founders face higher interest rates.⁸

² E.g., Dan Plotz et al., *This is How Structural Racism Works*, Business Insider (July 16, 2020).

<https://www.businessinsider.com/ppp-loan-study-shows-structural-racism-that-black-americans-face-2020-7>.

³ See, e.g., Jeffrey Mervis, *Study Identifies a Key Reason Black Scientists are Less Likely to Receive NIH Funding*, Science (Oct. 9, 2019), <https://www.sciencemag.org/news/2019/10/study-identifies-key-reason-black-scientists-are-less-likely-receive-nih-funding>.

⁴ Emily Birnbaum, “Were Your Grandparents Slaves?,” Protocol (Aug. 19, 2020), <https://www.protocol.com/black-founders-racism-discrimination-investing>.

⁵ Ann-Derrick Gaillot, *The Venture Capital World Has a Problem with Women of Color*, Girlboss (Jan. 21, 2019), <https://www.girlboss.com/read/venture-capital-woc-women-of-color>.

⁶ See, e.g., *Diversity in U.S. Startups*, RateMyInvestor, available at https://ratemyinvestor.com/diversity_report.

⁷ E.g., *Startup Funding Infographic*, Fundable, <https://www.fundable.com/learn/resources/infographics/startup-funding-infographic>.

⁸ Tatiana Walk-Morris, *For Many Black Entrepreneurs, VC Funding Remains an Uphill Battle*, ChicagoInno (June 4, 2018), <https://www.bizjournals.com/chicago/inno/stories/inno-insights/2018/06/04/for-many-black-entrepreneurs->

Developing an alternative to the credit score could begin to level the playing field, as these scores can be one of the greatest challenges facing (especially underrepresented) entrepreneurs seeking a loan to grow their business. Roughly 22 percent of adults in the U.S. have thin to no credit. But poor credit scores are often not indicative of an individual's ability to repay a loan. Policymakers and the industry should consider shifting focus to other, more holistic metrics to determine creditworthiness—for example, looking at timely rent, utility, and phone payments, checking account data, and property records as proof that a founder should receive a loan.⁹

- **Invest in education and training for diverse STEM and business educators.** The importance of a diverse tech talent pipeline cannot be understated. The government should continue to invest in STEM education and programs that help students transition into STEM careers. Another key lever for promoting diversity in the STEM workforce is cultivating a more diverse and inclusive STEM faculty. Only 10.1 percent of STEM faculty at four-year institutions are from underrepresented backgrounds. Expanding the number of diverse STEM and business educators would mean aspiring innovators and entrepreneurs can learn from leaders who represent them.¹⁰

Thank you for considering these suggestions. NCEAI has the opportunity to take up issues that are critical to our innovation ecosystems and the U.S. economy—but also fundamental to promoting justice and equity. We hope that these brief comments are helpful and encourage you to explore other ways the federal government can devote itself to successfully supporting underrepresented founders.

Sincerely,

10XTS, Inc.	Black Women Talk Tech
1863 Ventures	Blue Rayame
Aberrantmuse LLC	BlueSalve Partners
Accelerate NY Seed Fund	CBL Consultants
ACME AtronOmatic LLC / MyRadar	Center for American Entrepreneurship
Alerje, Inc.	CitiQuants Corp.
American Underground	Civic Ninjas
authentic LLC	Clevyr
Bims Laboratories, Inc.	CO.STARTERS

[vc-funding-remains-an.html](#); Alicia Robb et al., *Access to Capital Among Young Firms, Minority-owned Firms, Women-owned Firms, and High-tech Firms* (Apr. 2013), available at [https://www.sba.gov/sites/default/files/files/rs403tot\(2\).pdf](https://www.sba.gov/sites/default/files/files/rs403tot(2).pdf).

⁹ Melissa L. Bradley, *Expanding Credit Through Alternative Credit Scores*, Medium (Oct. 21, 2020),

https://medium.com/@melissa_6316/expanding-credit-through-alternative-credit-scores-R015c4edea29.

¹⁰ Jessica Bennett et al., *Strengthening Pathways to Faculty Careers in STEM: Recommendations for Systemic Change to Support Underrepresented Groups*, Assoc. Of Public & Land-Grant Univ. (2020), available at <https://www.aplu.org/library/strengthening-pathways-to-faculty-careers-in-stem-recommendations-for-systemic-change-to-support-underrepresented-groups/file>.

Cofounders Capital	LaunchTN
Column Software, PBC	Libib
Connell Wise & Associates	Liquos Corporation
Converge	Loop & Tie
Cornig LLC	Lovely
Courtroom5	M1PR, Inc.
CrowdCheck, Inc.	Make Startups
Crowdfundingroadmap Inc.	Mass Collaboration
Cybernetiqq	Maydel
DiverseCity Ventures	MedAnswers, Inc.
Door to Door Health Inc.	Mercury Fund
Eeve Corp.	Mind & Media, Inc.
Empathy Rocks, Inc.	MinkaWorksBK
Established	Mobius Audio
Eventbrite	MoreWithUs - Everyday Jobs
EveryLibrary	MyAgData
FEM Holdings	MyTAASK Technology
Fierce Female Founders	Netra Inc.
Fiskkit, Inc.	NETZRO, SBC
FounderTherapy, LLC	OculoTherapy
Glasswing Ventures	OneVet OneVoice
Hacom LLC	Onfleet, Inc.
Halcyon	Overcup Press
Hello Alice	Pear VC
High Fidelity	Physical Systems Inc.
High Mountain Ventures LLC	PIE
Houston Exponential	PositivEnergy
HumanKind Homes	Possip, Inc.
IncentiLock LLC	Productions.com
Inclusive Innovation Incubator	Ratio Innovation Management
Infiltron Software Suite	Reactwell, L.L.C.
JOOR Inc.	Right to Start
Lanyapp, Inc.	ScienceVest

SEED SPOT
ShareProgress
Spark MHK
SpotHero, Inc.
Start Co.
Started Companies Inc.
Startup Community, Inc.
Startup Maine Inc.
Startup Tucson
StartupSac
Sultan Ventures
Tada Technologies, Inc.
Tampa Bay Wave
TCG, Inc.
theClubhou.se
TheraTec, Inc.
Tostie Productions, LLC
Traits AI, Inc.
Venntive
VentureWell
VetsinTech
Vibe Coworks
Virtue Events, Inc.
Voatz, Inc.
Warmilu LLC
WorkHound
World Innovation Network
Xapix Inc.
XLR8HI



April 20, 2021

Dear Members of the Subcommittee on Intellectual Property of the Senate Committee on the Judiciary,

We applaud you for convening today's hearing and urge you, and colleagues across Congress, to explore the many ways the government can—and must—support more diverse and inclusive innovation ecosystems. This conversation, on *Improving Access and Inclusivity in the Patent System: Unleashing America's Economic Edge*, can be a valuable step toward that goal.

Engine is a non-profit that works with government and a community of thousands of high-tech, growth-oriented startups across the nation to support technology entrepreneurship through research, policy analysis, and advocacy. We appreciate the opportunity to submit this brief letter to the record of today's hearing.

The importance of diversity in innovation and entrepreneurship is no secret. Diverse teams generate better economic results and often produce more innovation. And the unique perspectives of diverse founders allow them to develop innovative solutions that serve the needs of more people. Moreover, especially as the nation is grappling with deeply rooted inequities, it is essential that the federal government understand and advance the role of the nation's innovation ecosystems as one path to creating wealth and economic opportunity in communities across the country that have been historically marginalized.¹

To truly dismantle the unjustified barriers underrepresented founders routinely face, lawmakers must look beyond the patent system. And "increasing the number of U.S. patents is probably not the answer."² But we applaud you for convening today's hearing, and hope you will continue to consider what the Subcommittee can do, within its jurisdiction, to advance the critical goals of diversity and inclusion.

The America Invents Act (AIA) made important strides. For example, it established regional offices of the U.S. Patent and Trademark Office (USPTO). Among other things, this enables more inventors and entrepreneurs to access the Office's resources. The AIA also created pro bono programs to assist under-resourced innovators who want to obtain high-quality patents. We encourage you to revisit these efforts, evaluate what is (and is not) working, and replicate successful

¹ See, e.g., Matt O. Dhairi, Jamie Dohopolski, & Phillip Malone, *Engine's Response to the Call for Comments on Expanding American Innovation*, Engine 3-4 (Feb. 23, 2021), available at <https://bit.ly/2NmfplQ> (Appendix A).

² Letter from 113 Startups, Investors, Entrepreneurs, and Support Organizations to Janine Scianna, USPTO (Feb. 23, 2021), available at <https://www.engine.is/news/startups-push-government-on-diversity-in-innovation> (Appendix B).

features elsewhere across the country. As we have previously noted, this could include adding more regional offices, expanding resources to existing ones, and incorporating trademark pro bono assistance into existing programs.³ Congress and the USPTO should also consider relaxing technical degree requirements in order to diversify the patent bar. And creating better demographic data sets—as proposed in the IDEA Act—is another essential first step.⁴ More must be done, but the conversation you are starting today promises to make important contributions toward the goal of creating more diverse and inclusive innovation ecosystems.

Finally, we have attached Engine’s Response to the Call for Comments on Expanding American Innovation (Appendix A) and a letter from 113 startups, entrepreneurs, investors, and support organizations to the USPTO regarding the building of more inclusive innovation ecosystems in the U.S. (Appendix B). We hope these materials can assist you and your colleagues as you continue with this critical work.

Sincerely,
Engine

³ See, e.g., Letter from Engine to Chairman Leahy and Ranking Member Tillis (Mar. 16, 2021), available at <https://www.engine.is/news/startups-need-congress-to-focus-on-balance-quality-and-inclusion-when-it-comes-to-ip>.
⁴ Press Release: Hirono, Tillis, Velázquez, Stivers Introduce Bipartisan, Bicameral Bill to Close the Patent Gap Faced by Women, Minorities (Mar. 9, 2021), <https://www.hirono.senate.gov/news/press-releases/hirono-tillis-velazquez-stivers-introduce-bipartisan-bicameral-bill-to-close-the-patent-gap-faced-by-women-minorities>.

Statement by Jeff Hardin & Patricia Duran

Inventors, Small Business Owners & Consultants on IP Strategy and Policy

Hearing on *Improving Access and Inclusivity in the Patent System: Unleashing America's Economic Engine*

United States Senate Committee on the Judiciary and Subcommittee on Intellectual Property
April 21, 2021

We are inventor-stakeholders, small business owners, and witnesses who provided public testimony pursuant to the United States Patent and Trademark Office (“USPTO”) public hearings on the Study of Underrepresented Classes Chasing Engineering and Science Success Act of 2018 (“SUCCESS Act”)¹. We submit this statement for the record of the Hearing on *Improving Access and Inclusivity in the Patent System: Unleashing America's Economic Engine*, held by the Senate Subcommittee on Intellectual Property on April 21, 2021. The commentary below is our own and does not reflect views of any entity with which we have or have had a professional relationship.

We applaud the U.S. Senate for its desire to improve access and inclusivity for underrepresented and independent inventors in the patent system, and it is our desire that Congress establish refined legislation to ensure our patent system comports with the Constitutional charter to “*promote the Progress of Science and useful Arts, by securing ... to Inventors the exclusive Right to their respective ... Discoveries*”².

I. Inventors Have Spoken: Post-grant Enforcement Concerns are a Barrier to Participation

We are Patricia Duran—minority female, naturalized U.S. citizen, and aspiring inventor—and Jeff Hardin—patented *pro se* inventor and small business owner—and we traveled to Alexandria, VA to assist the USPTO with commentary³ in the first of three SUCCESS Act hearings regarding the participation of women, minorities, and veterans in the patent system and entrepreneurial activities⁴. We presented *the most pressing question* facing today’s inventors when deciding whether to seek a U.S. patent:

“What good is a patent if one cannot defend it?”⁵

We were not alone. **Over 75% of the underrepresented inventor-stakeholders who provided public comments⁶ in the SUCCESS Act hearings expressed that *post-grant enforcement concerns are a barrier to participation in today's patent system*⁷.** The reason is obvious—*the ability to protect her invention is the sole reason why an inventor seeks a patent in the first place*, and failing that ability by a patent grant, pursuing the U.S. patent bargain becomes futile. For Congress to help underrepresented inventors, *both dimensions*—the front-end initial pursuit, and the back-end ability to enforce—must work in tandem. Moreover, the back-end dimension remains first and foremost, because *without the ability to*

¹ Study of Underrepresented Classes Chasing Engineering and Science Success Act, *Pub. L. No. 115-273, 132 Stat. 4158 (2018)*

² U.S. Const. Art I, Sec. 8, Cl. 8

³ Hardin & Duran, SUCCESS Act comments, <https://www.uspto.gov/sites/default/files/document/SUCCESSAct-Hardin-Duran.pdf>

⁴ 84 FR 17809, <https://www.govinfo.gov/enlent/plqs/FR-2019-04-26/trad-2019-08437.pdf>

⁵ Hardin & Duran, SUCCESS Act comments (speech), <https://www.youtube.com/watch?v=1LcofTz8Jeg>

⁶ SUCCESS Act Report, <https://www.uspto.gov/successact>

⁷ US Inventor, Article *SUCCESS ACT—Selected Public Comments*, <https://tinyurl.org/success-act-2021-report/>

enforce the patent grant, the front-end pursuit becomes moot. Below are just a few comments provided by underrepresented inventors during the SUCCESS Act study carrying these sentiments:

The real disparity ... is one of financial resources and not of color or sex ... I don't expect to participate in the US patent system any further unless this financial disparity is addressed. The USPTO should eliminate the IPR process for all patents initially filed by a small entity, a micro entity, and for inventor owned and controlled companies.

Tesia Thomas, minority female inventor⁸

[O]nce the inventor obtains their patent, the US patent system turns against the minority, women, and economically disadvantaged inventor. With the PTAB finding most of the patents it reviews invalid, the balance is tipped against the disadvantaged.

Richard Baker, licensing executive, patent agent, inventor⁹

The USPTO should not encourage more women, minorities, and veterans to file for patents, or its effect will be like a trap, or even a fraud, ... after spending so much money obtaining a patent ... [it] can be easily infringed or even invalidated.

Ronald Zhang, minority inventor¹⁰

II. Today's Underrepresented Class: The Independent Inventor & Small Business

When Congress passed the Leahy-Smith America Invents Act ("AIA")¹¹, fresh on its mind was the threat of patent trolls—"entities that vacuum up patents by the hundreds or thousands and whose only innovations occur in the courtroom" and that "hurt small businesses and independent inventors before they even have a chance to get off the ground."¹² Accordingly, the AIA's sense of Congress puts emphasis on "protecting the rights of small businesses and inventors from predatory behavior"¹³. However, *the unintended consequences of the AIA enabled a new type of troll—the efficient infringer*¹⁴—whose only innovation occurs at the Patent Trial and Appeal Board ("PTAB"), where small businesses and independent inventors have their granted patents stolen and are bled dry before they even have a chance to compete.

The underrepresented inventors who testified during the SUCCESS Act study recognize this and expressed that *inter partes* review ("IPR"), for example, created by the AIA **unintentionally stacked the deck against smaller entities, which includes women, minorities, veterans, and all independent inventors who seek patent protection.**

Inventors are a minority class, and it is crucial that we concurrently increase the enforceability of those patents held by minorities of women, veterans or any other class, but mostly the patents held by this minority of people called independent inventors. Patents have become liabilities for independent inventors thanks to the PTAB and lack of strong enforcement in court. If the recommended legislation

⁸ Thomas, SUCCESS Act comments, <https://www.uspto.gov/sites/default/files/documents/SUCCESSAct-Thomas.pdf>

⁹ Baker, SUCCESS Act comments, <https://www.uspto.gov/sites/default/files/documents/SUCCESSAct-BEP.pdf>

¹⁰ Zhang, SUCCESS Act comments, <https://www.uspto.gov/sites/default/files/documents/SUCCESSAct-Zhang.pdf>

¹¹ Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011)

¹² H.R. 1249, Congressional Record Vol. 157, No. 91, <https://www.congress.gov/congressional-record/2011/06/23/house-section/article/14480-1>

¹³ Sec. 30, Sense of Congress, Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011)

¹⁴ <https://www.ipwatchdog.com/2017/03/17/tech-ruling-class-st/files-innovation-efficient-infringement/id-79191/>

does not include increased protection of patents, we will end up destroying the lives of the very individuals we intend to help.

Kip Azzoni Doyle, female inventor¹⁵

John M. Whealan, who served as Counsel to the Senate Judiciary Committee and advised on legislation that became the AIA, recently testified to the U.S. House Subcommittee on Courts, Intellectual Property, and the Internet¹⁶, where he agreed that *unintended and negative consequences were created by the AIA*:

IPRs have had a profound effect on the patent system. [They] share many of the attributes as were feared of PGR second window, including inability to quiet title and multiple and serial petitions. IPRs have devalued every single U.S. patent. Patents are supposed to be presumed valid. They are not before the PTAB. Invalidity must be proven by clear and convincing evidence. Not at the PTAB. The numbers confirm this. There are over 1,400 filed each year—that's 3.5 times as many as the USPTO estimated to Congress. IPR petitioners fare much better than patentees, given IPRs are instituted over 60% of the time, and in final decisions, some claims are invalidated 80% of the time.

... But laws can have unexpected and unintended consequences.¹⁷

IPRs at the PTAB were purported to being a faster and cheaper alternative to litigation¹⁸, but the question is, faster and cheaper for whom? It is not uncommon for patent-infringement litigation in district court to be stayed for two or three years, pending the disposition of IPRs challenging the asserted patents and any subsequent appeals to the Federal Circuit. This very thing defeats the purpose of IPRs serving as a substitute for litigation; rather, they are in addition to it, being so ubiquitous that it's now almost malpractice not to file an IPR¹⁹. In fact, of the more than 12,000 IPR petitions that have been filed between September 16, 2012 and November 30, 2020, less than 2% comprise small and medium-sized entities against nonpracticing entities, or NPEs. The vast majority of petitions are filed by large operating companies, usually against a smaller competitor.²⁰ Furthermore, new business models have arisen, such as those whereby surrogate companies challenge patents on behalf of large subscribing corporations without having time bar limitations.²¹

Given these post-grant risks—combined with i) an estimated mean cost of \$450,000 to undergo a single post-grant challenge²² and ii) the fact that no monetary recovery is provided to patentees lucky enough to survive a review at the PTAB—attorneys' fees for an inventor to defend her patents at the PTAB are strictly on her own dime; contingency representation for inventors is off the table. The odds are starkly against today's underrepresented/independent inventor and small business. The bottom line: *if an inventor ultimately cannot defend her patents, she will not apply for them.*

¹⁵ Doyle, SUCCESS Act comments. <https://www.uspto.gov/sites/default/files/documents/SUCCESSAct-Doyle.pdf>

¹⁶ Hearing: *The Patent Trial and Appeal Board & the Appointments Clause*. <https://judiciary.house.gov/calendar/evenbingle.aspx?eventID=2249>

¹⁷ *Id.* (Whealan, opening statement at 1:11:27.)

¹⁸ H.R. 1249, Congressional Record Vol. 137, No. 91. <https://www.congress.gov/congressional-record/2011/06/23/house-section/article/114480-1>

¹⁹ <https://www.ipwatchdog.com/2021/04/22/ptab-masters-day-four-judge-michel-facts-change-views-change/id=132637/>

²⁰ Malone, *PTAB Trials Disproportionately Harm Small Businesses*. <https://www.law360.com/articles/1348182/ptab-trials-disproportionately-harm-small-businesses>

²¹ Hoyle, *Is Unified Patents a War Profiteer?* <https://www.ipwatchdog.com/2020/03/31/unified-patents-war-profiteer/id=120267/>

²² 2017 AIPLA Report of the Economic Survey. <https://www.aipla.org/dtmi/journal-issue/economic-survey-2017>

III. The IDEA Act's Missing Data Problem

Congress hopes to help bridge the gap of underrepresentation among patent holders with the introduction of the Inventor Diversity for Economic Advancement (IDEA) Act of 2021. This legislation would establish policy to collect demographic data on patent *applicants*. Albeit important, unfortunately *the IDEA Act's collection on patent applicants will not position Congress to help underrepresented inventors who elect to not apply for patents in the first place—the very class Congress intends to help*. This is because an inventor's demographic data cannot be collected from an application if she doesn't apply.

In fact, following the stark revelations obtained during the SUCCESS Act study, the Patent Public Advisory Committee (PPAC) identified this very "missing data" problem when discussing the use of patent applicant data:

[R]elated to economically-disadvantaged inventors...there's a cost and clear-perceived risk associated with, not only filing the application, but also protecting it thereafter in PTAB. [T]here are less inventors in that subpopulation who will be entering into the patent application process. So, while you are collecting information on patent applicants, there is the issue of missing data—you're not able to collect data on inventors who are in that population—the economically-disadvantaged—who aren't entering the arena.²³

Despite the USPTO admitting this as a challenge, no legislative solution was provided in its SUCCESS Act Report to Congress to address these participation barriers. Fortunately, however, inventor-stakeholders informed the U.S. House Committee on Small Business of H.R. 5478, the *Inventor Rights Act of 2019*²⁴, which set out to provide narrowly targeted relief to inventors who own their patents²⁵.

IV. The Solution: Pull Inventors Out from Under the Bus

Inventors are the true source of American innovation, and *because inventors are not patent trolls, we encourage Congress to pass legislation that gives inventors who own their patents the right to consent prior to their patents being challenged at the PTAB.*

This would pull inventors out from under the bus while remaining consistent with the AIA's sense of Congress to protect small businesses and independent inventors from predatory behavior, whether it be from patent trolls in the courtroom or efficient infringers at the PTAB. If the PTAB ultimately does provide a faster and cheaper alternative to litigation, inventors will gladly pursue that tribunal.

²³ Camacho, comments to USPTO, PPAC Quarterly Meeting, <https://www.youtube.com/watch?v=50LfrCz8HfI>

²⁴ H.R. 5478, *Inventor Rights Act of 2019*, <https://www.congress.gov/bills/116/5478/congress/house-bill/5478/text>

²⁵ Inventor Letter to Congress, <https://inventor.org/wp-content/uploads/2020/01/Inventor-Letter-to-Rep-Velozquez-re-SUCCESS-Act.pdf>

V. Conclusion: For Inclusivity, Include the Inventors' Voice

Whealan's statement to Congress emphasized that a critical voice—that of the inventor—has been missing from the discussion, and he strongly recommended that Congress consider IPRs from the patentee's perspective, reminding us that "without them, we wouldn't be here."²⁶

Inventors desiring access and inclusivity have spoken. Congress must first right the ship. Doing so will help underrepresented, independent inventors and small businesses gain confidence that the patents they ultimately will receive can be adequately enforced, which will incentivize them all the more to participate in the U.S. patent bargain to protect their inventions and businesses.

Let us unleash America's economic engine and leave no "lost Einstein" behind.

Respectfully submitted,



Jeff Hardin
Pro Se Inventor
<https://www.linkedin.com/in/jeff-hardin/>



Patricia Duran

²⁶ Whealan, Written Statement, Hearing: *The Patent Trial and Appeal Board and the Appointments Clause*, <https://docs.house.gov/aoestmcs/JU/2019/20191119-110260/H11RG-116-11303-Wstmg-Whealan-1-20191119.pdf>



IPO's Strategic Priorities
 Shape the Future of IP
 Foster Diverse Engagement
 Ensure Effective Governance



IPOEF Strategic Priority
 Promote innovation and creation by, within,
 and for underrepresented communities.

Efforts by IPO and IPO Education Foundation to Increase Diversity in the Innovation Ecosphere

1. Gender Diversity Toolkit

- a. Toolkit launched in 2019 by the Women in IP Committee to help organizations move the needle on achieving gender parity in innovation.
- b. Webinars quarterly to discuss the toolkit in action at corporations like Facebook and 3M.
- c. Participant in USPTO Women's Entrepreneurship Symposium to discuss gender diversity.

2. Practical Guide to Diversity & Inclusion in the Legal Professional

- a. Launched in 2020 by the Diversity and Inclusion Committee to encourage companies to prioritize diversity in their organizations, including how to train and maintain these practices in their communities.
- b. The Practical Guide includes topics such as:
 - i. Defining: diversity, inclusion, implicit bias
 - ii. Why a company should prioritize diversity and the benefits
 - iii. Assess potential causes of lack of diversity and potential best practices for promoting diversity
- c. IPO Resource Groups collectively provide yearly deliverables in the spirit of advancing diversity and inclusion in professional atmospheres.
 - i. Black IP Professionals
 - ii. Hispanic IP Professionals
 - iii. Asian IP Professionals
 - iv. Pride and Allies IP Professionals

3. How to Be An Ally in the Legal Profession

- a. A three-part webinar series giving practical advice to professionals on how to use their voice and influence to improve both diversity and inclusion in the legal profession.

4. *Stroke of Genius*® Podcast

- a. Podcast series exploring stories from the world of intellectual property featuring inventors, innovation, and creation. From famous copyright cases to the unheard stories

behind impactful inventions, each episode transports the listener to a different place within the landscape of human innovation.

- b. Season four will be released in April 2021 featuring stories from underrepresented communities. Some topics include:
 - i. Innovation spurred by the pandemic,
 - ii. Immigrant companies, and
 - iii. How to protect protest art.
- c. Season three podcast episode titled “The Right to Invent” released in September 2020 tells the often-unheard story of African American inventor Lewis Latimer who worked with Thomas Edison and made the lightbulb more practical and affordable for the average household. Featured guests include Dr. Lisa Cook (Michigan State University) and Dr. Lataisia Jones (STEMing While Black).
- d. The podcast features a diverse group of innovators and technologies, some past episodes include:
 - i. Lonnie Johnson (Super Soaker)
 - ii. Patricia Bath (Cataract Surgery)
 - iii. Anna Stork and Andrea Sreshta (LuminAID solar powered inflatable light)
 - iv. Manu Prakash (Foldscope)
 - v. Lisa Seacat Deluca (Most prolific female inventor at IBM, Corp.)
 - vi. Temple Grandin (author, inventor, autism activist)

5. Behind the IDEA Webinar Series

- a. A free webinar series created for high school and college students from underrepresented communities.
- b. Topics include innovation and creation by, within, and for underrepresented communities:
 - i. What is IP?
 - ii. Careers in STEM
 - iii. Herstory of Invention
 - iv. World IP Day – Taking Ideas to Market
 - v. Pacific Islander/Asian History Month
 - vi. Pride Month
 - vii. Hispanic Heritage Month
 - viii. How to Have a JEDI Mindset (Justice, Equity, Diversity, and Inclusion)
 - ix. How to be a Good Copyright Steward

6. IP Patch Curriculum

- a. Familiarizes students, grade 2-10, with invention and intellectual property and encourages them to enter STEM careers catering to diverse audiences with varying socioeconomic backgrounds.
- b. The IP Patch began in 2012 as a partnership between the Girl Scouts and USPTO to promote girls in STEM. This program has expanded outside of Girl Scouts and has been utilized by various groups including:
 - i. Athletes Without Borders
 - ii. Georgia STEM Expo
 - iii. IBM headquarters “Take your Child to Work Day”

- iv. Finnegan Henderson DC office STEM event
- v. Erise IP and Ford
- vi. Penn State Law School

7. Innovator Spotlight

- a. Featured on IPOEF.org to highlight diverse innovators who have impacted the IP and innovation industry.
- b. Highlights include:
 - i. February – Black History Month
 - ii. March – Women History Month
 - iii. May – Asian Pacific American Heritage Month
 - iv. June – LGBTQ+ Pride Month
 - v. September – Hispanic Heritage Month

April 19, 2021

The Honorable Patrick J. Leahy
 Chairman, Subcommittee on Intellectual Property
 Senate Judiciary Committee
 United States Senate
 Washington, D.C. 20510

The Honorable Thom R. Tillis
 Ranking Member, Subcommittee on Intellectual Property
 Senate Judiciary Committee
 United States Senate
 Washington, D.C. 20510

Re: S.632, the IDEA Act

Dear Senators Leahy, Tillis, and members of the Subcommittee on Intellectual Property.

I write to you to express my concerns regarding the potential impact of the proposed legislation in S.632, the IDEA Act, on the operation of the U.S. Patent and Trademark Office ("PTO"). I do so particularly because the hearing on this bill scheduled for March 25, 2021 was cancelled with no stated reason and because it now appears that the bill may move to markup without establishing a record of inputs from the PTO or those involved in the patent application process at the PTO.

I am an inventor, entrepreneur, and an independent scholar of the patent system. I am a named inventor on 25 U.S. patents and applications, and have founded two startup companies based on patented technologies. I have extensive experience in patent prosecution at the PTO and related administrative law. During the 116th Congress, I [provided a statement](#) upon request to the record of this Subcommittee on matters related to patent prosecution at the PTO. I am a member of the Intellectual Property Committee of IEEE-USA, having served as its chairman until last year, and I also serve on the Patent Committee of the Small Business Technology Counsel. This letter is written on my own behalf in my individual capacity, representing neither organization.

I strongly support closing the societal gaps in the abilities of individuals to participate in, and benefit from, invention and technological innovations; and I believe that this is also the well-intended goal of the sponsors and supporters of the IDEA Act. However, in its current form, the bill will have unintended consequences and would fail to properly inform us about the causes of demographic disparities in patenting. I explained this in detail in my article on the subject.¹

Particularly in regards to the bill's requirement for PTO procedures to ensure that examiners have no access to "demographic information," it has been suggested that the bill intends this requirement to apply only to the specific information voluntarily provided pursuant to the bill. However, that is *not* what the plain language of the bill as written provides, nor how it would reasonably be interpreted by the PTO, were it to attempt implementing the statute as currently written. Rather, this bill goes further in contradiction with the Patent Act—it requires the PTO to ensure that *any* "demographic information is not made available to examiners or considered in the examination of any application for patent." Proposed 35 U.S.C. § 124(b)(s)(B). To see this, note proposed Section 124(b) (my emphasis):

"(b) Protection Of Information.—The Director shall—

"(1) keep *any information submitted under subsection (a)* confidential and separate from the application for patent; and

"(2) establish appropriate procedures to ensure—

"(A) the confidentiality of *any information submitted under subsection (a)*; and

"(B) that *demographic information* is not made available to examiners or considered in the examination of any application for patent.

Specifically, proposed subsection (b)(2)(B) refers to "demographic information" broadly, without *any limitation* to information specifically collected under subsection (a). The limit recited in subsections (b)(1) and (b)(2)(A)—"information submitted under subsection (a)"—is conspicuously missing from subsection (b)(2)(B). Any reasonable interpretation under established canons of statutory construction would *not* read the limitation in subsection (b)(2)(A) as also applicable to subsection (b)(2)(B). To the contrary: the apparently deliberate asymmetric omission of the "information submitted under subsection (a)" limitation from subsections (b)(2)(B) must be read as an *intended* distinction—that, as opposed to subsection (b)(2)(A), subsection (b)(2)(B) is directed to a broader requirement to prevent examiner access to *any* "demographic information"—not merely to the "information submitted under subsection (a)." This reading is compelled as one must generally read as meaningful "the exclusion of language from

¹ Ron D. Katznelson, "The IDEA Act is a Bad Idea," (March 23, 2021). Available at <https://bit.ly/Bad-IDEA>.

one statutory provision that is included in other provisions of the same statute.²² Subsection (b)(2)(B) does not use the term “the demographic information” collected under subsection (a), but ineluctably refers to *any* “demographic information” on all inventors, as available to the PTO by any means.³

As currently written, there could be no other reasonable explanation for this legislative language asymmetry except the construction as explained above, which may ostensibly be bolstered by a plausible argument that the *policy* denying examiners any access to “demographic information” should apply *regardless* of whether or not it was collected in the survey under subsection (a). Indeed, this broad policy was advocated to Congress and the Biden Administration in a proposal for removing inventors’ names from patent applications to “mitigate potential gender and racial biases” in PTO examination.⁴ In light of the sponsor’s [press release](#) explanation that the bill’s *purpose* is “to close the gap that women, minorities, and others face when *procuring* patent rights in the United States,” one can easily conclude that subsection (b)(2)(B) was deliberately written as a first remedial step intended by the bill—requiring the PTO to deny examiners access to *any* “demographic information” in order to “mitigate potential gender and racial biases.”⁴

The opposite contention that subsection (b)(2)(B) is *not* so intended to be such a remedial first step would be more credible had the drafters of the bill actually stated so in the text—if they had not crafted explicit asymmetry between subsections (b)(2)(A) and (b)(2)(B). Under this subsections’ asymmetry, the scope of “any information submitted under subsection (a)” in the former, manifestly differs from the broader scope of “demographic information” in the latter. In other words, the following revision that would make those two subsections *identically-phrased* would reliably remove any inference that subsection (b)(2)(B) is intended to apply more broadly than subsection (b)(2)(A):

“(b) Protection Of Information.—The Director shall—

“(1) keep any information submitted under subsection (a) confidential and separate from the application for patent, and

“(2) establish appropriate procedures to ensure—

“(A) the confidentiality of any information submitted under subsection (a); and

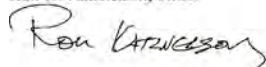
“(B) that ~~demographic~~ any information submitted under subsection (a) is not made available to examiners or considered in the examination of any application for patent.

With the above revision adopted, the concerns I expressed in Section 1 of my article would be rendered moot. I urge the adoption of his revision to instill confidence that the bill does not seek to do more than authorize collection of information.

Finally, Section 6 of my article discusses why the information to be collected under the bill will be insufficient to identify the *causal* determinants, or the *contributing* factors that *drive* the disparities in the patenting gaps. Consequently, we will have no information on *what needs to be done* to close such gaps. To properly conduct such survey, the type of information to be collected *in the same inventor sample* must include data on important predictors and essential explanatory factors for patenting disparity related to the *same inventors’* experiences, education, research, mentorship, prior activities, etc. The type and scope of this data collection should be determined by independent and objective scientific experts in technology, education, STEM training, and social sciences. They should also design the survey framework to ensure its statistical validity and compliance with the Federal Information Quality Act. The PTO has no institutional expertise to define and design such social science-based surveys. The bill should be amended to authorize instead a National Academy of Sciences advisory committee for establishing the requisite information, including the inventor demographic survey design and analysis plan, on which Congress could later rely to authorize the PTO to collect the requisite information.

Respectfully submitted,

Ron D. Katznelson, Ph.D.



² *Hamdan v. Rumsfeld*, 548 U.S. 557, 578 (2006); See also *Russello v. United States*, 464 U.S. 16, 23 (1983) (“[W]here Congress includes particular language in one section of a statute but omits it in another section of the same Act, it is generally presumed that Congress acts intentionally and purposely in the disparate inclusion or exclusion.”)

³ E.g., the Office of the Chief Economist at PTO has established an [inventor gender database by gender attribution methods](#). See also <https://www.uspto.gov/ip-policy/economic-research>. That demographic information is available to examiners.

⁴ A group calling itself the “Day One Project” proposed a “program at PTO that removes inventor names and attorney names from patent application (as they are available to patent examiners) in order to mitigate potential gender and racial biases.”



April 16, 2021

The Honorable Patrick Leahy
Chair, Subcommittee on Intellectual Property
Senate Judiciary Committee
United States Senate
437 Russell Senate Office Building
Washington, DC 20510

The Honorable Thom Tillis
Ranking Member, Subcommittee on Intellectual Property
Senate Judiciary Committee
United States Senate
113 Dirksen Senate Office Building
Washington, DC 20510

Chairman Leahy and Ranking Member Tillis:

Intellectual Property Owners Association is delighted that the Senate Judiciary Subcommittee on IP has planned a hearing on "Improving Access and Inclusivity in the Patent System" and applauds your leadership on this important issue. As an international trade association representing a "big tent" of diverse companies, law firms, service providers, and individuals in all industries and fields of technology that own, or are interested in intellectual property (IP) rights, IPO prioritizes fostering diverse engagement in the innovation ecosystem and seeks to integrate diversity, equity, and inclusion in all our work. IPO Education Foundation (IPOEF), the association's affiliated 501 (c)(3) foundation, has a strategic priority to promote innovation and creation by, within, and for underrepresented communities.

Following the testimony of Sandra Nowak from 3M Company, a member of IPO's Women in IP Law Committee, before the Subcommittee in 2019 about the importance of closing the gender gap in patenting, IPO released its "Gender Diversity in Innovation Toolkit," a blueprint for companies to assess and cultivate gender parity. Moreover, we have expanded our focus to assessing and promoting diversity & inclusion of all types in innovating as well as in the IP profession. IPO applauds your urging the USPTO to address the gender gap among patent practitioners and is preparing comments to the agency with concrete ideas to effectuate that goal. Recently, IPO and IPOEF wrote to support introduction of the IDEA Act, which would require such data as the crucial first step toward addressing underrepresentation. Disparity in opportunities to obtain patents impairs economic growth and American innovation. We support the Subcommittee's sustained commitment to remedying inequities in this area and welcome the opportunity to support your efforts.

Sincerely,

Handwritten signature of Jessica K. Landacre

Jessica K. Landacre
Executive Director

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