PUBLIC HEARING ON THE SUCCESS ACT

Monday, June 3rd, 2019

9:00-4:00 p.m. PT

Silicon Valley United States Patent and Trademark Office

West Wing Building of San Jose City Hall

26 South 4th Street

San Jose, California 95113
AGENDA

WELCOMING REMARKS
   John Cabeca, Director of the Silicon Valley United States Patent and Trademark Office
   Julie Clowes, District Director, San Francisco District Office, Small Business Administration

PROGRESS AND POTENTIAL: A PROFILE OF WOMEN INVENTORS ON U.S. PATENTS
   Amanda Myers, Deputy Chief Economist, Office of Policy and International Affairs, USPTO

OVERVIEW OF SUCCESS ACT
   Amanda Myers, Deputy Chief Economist, Office of Policy and International Affairs, USPTO

ROUNDTABLE LOGISTICS
   Amanda Myers, Deputy Chief Economist, Office of Policy and International Affairs, USPTO

PUBLIC TESTIMONY
   Robert F. Granadino, COO, inteliGlas Corporation
   Cecilia Corral, CareMessage
   Stephanie Couch, Executive Director, Lemelson-MIT Program, MIT School of Engineering
   Colleen Chien

BREAK

PUBLIC TESTIMONY
   Sheng Tai (Ted) Tsao, President of STT WebOS, Inc.
   Britten Sessions, Lincoln Law School of San Jose
   Robin Feldman, University of California, Hastings College of the Law

LUNCH

PUBLIC TESTIMONY
   Tina Dorr, Counsel, Cantor Colburn LLP, Secretary, Women in IP Committee, Intellectual Property Owners Association
   Liji Gopalakrishnan, Rambus, Inc.
   Charu S. Kurani, Facebook

CLOSING REMARKS
   John Cabeca, Director of the Silicon Valley USPTO
MR. CABECA: Good morning, everyone. We're going to go ahead and get started so apologies for the delay, and we'll continue to work out our technical difficulties for those online, but I didn't want to put us any further behind the schedules since we have a tight agenda for today.

First of all, I'd like to welcome all of you to the SUCCESS Act public hearing. I'm John Cabeca. I'm the regional director here for the Silicon Valley USPTO, and it's a pleasure to be here today to discuss how we can expand the innovation ecosystem. Women constitute over half of the U.S. population, and their participation in the general U.S. workforce was almost two-thirds in 2016, yet women's participation in STEM fields and in the intellectual property system lags far behind their male counterparts. In the United States, less than one-quarter of the STEM workforce comprises women, plus half of these women who work in STEM fields leave after 12 years, most within the first five.

The participation of women as inventors named on U.S. patents is even lower. On February 11th, 2019, the USPTO released a report entitled "Progress and Potential: The Profile of Women Inventors on U.S. Patents." And you'll hear a brief overview of that report shortly, and I believe you-all have copies for those
of you sitting here around the room.

What you'll find is the study showed that, although the number of patents with at least one woman inventor increased from about 7 percent in the 1980s to 21 percent in 2016, but despite that, with the total pool of inventors in the U.S., women inventors still comprise only 12 percent of all inventors on patents granted in 2016.

The purpose of today's hearing is because we all realize that we can and should do better. If we are to maintain our technological leadership, the United States cannot continue to compete with so much talent left untapped. In order to unleash this talent, industry, academia, and government must work together to address these issues and drive towards real progress. We, at the USPTO, are committed to making opportunities for innovation available to everyone.

A recent Harvard study found that increasing innovation rates among women, minorities, and children from low-income families could quadruple the rate of U.S. innovation. Clearly, unleashing this untapped potential holds tremendous benefit for all Americans.

The Trump Administration and Congress have recognized this critical issue and the need for action. On October 31st,
2018, President Trump signed into law the Study of Underrepresented Classes Chasing Engineering and Science, SUCCESS Act of 2018 -- which is known as the SUCCESS Act. The SUCCESS Act requires the USPTO director, in consultation with the U.S. Small Business Administration, to provide Congress with a report on publicly available patent data regarding the representation of women, minorities, and veterans, along with legislative recommendations. These recommendations should be provided on how to promote the participation of women, minorities, and veterans in entrepreneurial activities, and it should also suggest how to increase the number of women, minorities, and veterans who apply for and obtain U.S. patents.

In accordance with the SUCCESS Act, the USPTO has taken steps to gather information on the participation of women, minorities, and veterans in patent and entrepreneurial activities, and today's hearing, in partnership with the SBA, is one of such efforts. Everyone -- individuals, businesses, and non-profit organizations -- can contribute valuable information and offer productive recommendations. This helps to stimulate entrepreneurialship and use of the patent system by these underrepresented groups. Today's hearing is the second of three
public hearings that the USPTO is holding throughout the country
to obtain comment in support of the SUCCESS Act study. The first
hearing was held at USPTO's headquarters on May 8th in Alexandria,
Virginia, today is our second, and the third hearing will be in
our other regional office in Detroit on June 18th. Is that right?

At each of these hearings, we welcome representatives
from industry, law, and academia to present oral testimony on the
participation of women, minorities, and veterans in
entrepreneurialship impact activities. We value your insight and
recommendations regarding efforts to increase the patents, applied
for and obtained by women, minorities, and veterans regarding
public policies or other initiatives to promote the participation
of such underrepresented groups in the patent system and
entrepreneurial activities and regarding the role that the USPTO
should play in addressing these important matters.

So thank you very much for your participation today. We
look forward to hearing everyone's views. And with that, it's my
great pleasure to now turn the mic over to Julie Clowes, who is
the SBA, Small Business Administration, district director for the
San Francisco Small Business Administration. Is that right?

MS. CLOWES: Sure.

MR. CABECA: All right. Thank you.
MS. CLOWES: Good morning, everyone. Thank you, John, and thank you to the USPTO for hosting this hearing. Obviously, as SBA, we are the agency charged with assisting small businesses, and we do that in a variety of means, whether it's through financial assistance, whether it's through free business counseling and training and access to government contracts. So I think with getting information from the community is really important and critical to make sure that we are providing and using our tools to create tools for you-all and for everyone to access the entrepreneurial system. There's a lot of resources, especially here in the Bay Area, and I am really interested to hear what some of the challenges are from your perspectives to see if we can channel those resources then to provide additional support and make sure everyone has got access to that support to be successful, to be innovative, and to be the next, you know, job creators in our economy.

So I really thank you, again, to PTO. I really am looking forward to hearing all of your comments and seeing what we can start implementing right away and then what the recommendations might be moving forward for, you know, new legislation or new programming that will benefit everybody. So I appreciate your time and energy, and, again, I look
forward to your comments and perhaps working with some of your
organizations as we move forward, so thank you.

MR. CABECA: Thank you.

MS. MYERS: Hello. My name is Amanda Myers. I am the
deputy chief economist at the U.S. Patent and Trademark Office,
and I am here to present -- if I can get my slides to work --

MR. CABECA: Try pointing that way.

MS. MYERS: I apologize. Technical difficulties. I am
going to cut my remarks quite a bit just so we can stay on time
with the public testimony.

ALAN: Do you want me to go ahead and share that screen
right now?

MR. CABECA: Yes.

ALAN: All right. I just have to focus on that and then
I can share the screens.

MS. MYERS: I'm okay.

MR. CABECA: Okay. Go ahead.

MS. MYERS: Well, hold on. All right. Let me get
started.

I'm here today to present an overview of the report that
John referenced entitled "Progress and Potential: A Profile of
Women Inventors on U.S. Patents." This is a report that the USPTO
released in February. As I said, in the interest of time, I'm going to go through this pretty quickly and see if there were a few slides, just to catch us back up.

But just a quick on motivation and objectives in the report, we know that, historically and currently, women comprises a small minority of patent inventors, and this represents a significant untapped innovative talent that is untapped potential that may spur innovation and drive economic growth. And as John referenced, an interesting report out of Harvard that suggests that harnessing these very intelligent women and children of different racial minorities really could bring about economic growth and spur a lot of innovation outside of what we currently have.

And so we developed this report entitled "Progress and Potential: A Profile of Women Inventors on U.S. Patents" in order to study what we know about women inventors in the United States over a 40-year period. We really understand where they're patenting and on the trends that we're seeing over time.

And I'm going to skip through this part just in the interest of time and go straight to some of our findings.

So this is 40-year trends in women on U.S. patents. These are the women that are named as inventors on U.S. patents.
There are three different trend lines that we're showing. The purple line is the share of patents with at least one woman inventor on the patent teams, the share of patents that have a female as the sole inventor or part of an inventor team.

The green line is what we call the women inventor rate. This is actually the share of inventors that are named on patents that are women. And these -- and the yellow line is what we do -- is called the women share of total patenting. If there's multiple inventors on the team, we include the patent equally to each inventor on the team.

But I'm going to focus us on the first two lines. So the purple line is a figure that we see a lot and we have seen previously in other statistics and other reports that talks about women's increasing participation on patents. We see, over time, there has been some progress with women on 5 percent of patents in the early '80s, up to now, 22 percent of patents having at least one woman on the inventor team in 2018.

What we're seeing less of is that women are actually making up or comprising the inventor population at that rate. So the green line shows what portion of inventors, as unique inventors, that are women. And what we see is that that line had grown over time to about 2,000, where it settled at about 10
percent. And since then, we have only seen a little bit of progress. In 2016, only 12 percent of inventors on patents were women. And so while we're seeing upward growth over time, we're actually seeing much slower growth in the last 15 years in all of these indicators than we have in the prior 30. These are just trends that we are showing that we have some progress, but it has slowed in recent years and suggest that more can be done.

Lost control of my sights. Okay.

MR. CABECA: Sorry about that.

MS. MYERS: We know that many factors contribute to the ability and propensity of women and others to become inventors, and one of those is clearly your occupational and educational choice. The vast majority of patent inventors are in the science and engineering fields, and if women are less represented in those fields, we would expect them to be less represented as patent inventors as well.

So, in the report, we actually compare the share of patent inventors that are women with the share of women that are in science and engineering occupations. These are occupation rates for females based off of national survey data from the National Science Foundation. And so what you see is that, across
various sciences in engineering disciplines, women are participating at a much higher rate than they are patenting. For example, the top purple line, which is biological and by scientist, women now comprise almost half of the scientists in those fields. However, when we look at patenting in those areas -- pharmaceuticals and biotech -- women are still only about 25 percent of inventors.

And so the green line is still that same women inventor rate from the prior slide, but this is just to show that we are seeing women in these fields and pursuing these careers but not patenting at the same propensity that we see them in those occupations.

And this is the top 20 states. This is the share of women inventors based off of where they reside when the patent was granted. We see the highest rates among Delaware, District of Columbia, New Jersey, and Maryland. These are areas where actually women are just more prevalent in the workforce generally. They tend to be higher female participation rates overall in the workforce.

They also tend to be characterized by a lot of public sector and academic activity, which -- where women are also more prevalent in terms of patents.
And this is a look at where women are patenting by technology sector. This is based off of the technology that we observed in the patent. And this is a 40-year picture. You see each decade over time. What we see over time is that women tend to be in certain areas, and that's where also we see the most progress. Women comprise about just over 5 percent of patents in chemistry in the late '70s, early '80s, and in the last decade, they're actually at about 18 percent of patents that are granted -- 18 percent of inventors with patents granted in chemistry.

We also see a lot of progress in design patents, which will be included in this report. Where we're seeing much less progress really is in the chemical and engineering. That's not entirely surprising. There are many fewer women in mechanical engineering, so it's not surprising that we are seeing them appear as inventors on fewer patents in those technology areas.

But, overall, what we see is women specializing in technology fields and sectors where their predecessors have patented in the past, not entering these male-dominated areas.

ARMANDO: You know what, I'm going to (indiscernible.)

MS. MYERS: A lot of technical difficulties. Just going to keep going, just in the interest of time.
In the report, we actually profile some of the top patent holders in the country, and we look at the share of women in their inventor populations. And this is very small, so you may not be able to see it. But at the top is Proctor & Gamble, Bristol-Myers Squibb, and Abbott Technologies -- I mean, Abbott Laboratories. These are all pharmaceutical, biotech companies where women do tend to be more prevalent, and we are seeing more participation.

And I'm going to do one more slide and then just go to overview of our key findings. When we go back and look at the share of patents with at least one woman inventor on the patent team, we see that most of that progress is really driven by gender-mixed teams. All women teams or just single female inventors continue to comprise only about 3 percent of the patents, and that's been consistent over time pretty much for the last four decades. So all of the participation improvement we have seen over time has been women participating on teams, and what we see is those teams are actually growing in size. Women are on larger and larger teams.

So let me just quickly run through the findings in the report. Women continue to comprise a small minority of patent
inventors accounting for only 12 percent of all inventors on patents granted in 2016. Gains in female participation in science and engineering applications and entrepreneurship, which we don't show but is also the case, are not leading to broad increases in female patent inventors.

Technology-intensive states and those where women comprise a large percentage of the state's overall workforce show higher rates of women inventors. Women inventors are increasingly concentrating on specific technologies, suggesting that women are specializing in areas where female predecessors have traditionally patented.

Businesses have the lowest women inventor rates among the various categories of U.S. patent owners. Business rates tend to be much lower than academics -- academia as well as public research institutes for government-funded patents.

Women are increasingly likely to patent on large, gender-mixed inventor teams, highlighting the growing reports of understanding the relationship between gender and innovative collaboration.

So that is an overview of our report. I have handed out copies. I encourage you to look through it for more detail. And now, I'm going to switch over and discuss -- spend a few minutes
reviewing key parts of the SUCCESS Act, which is the reason we are all here today.

The SUCCESS Act -- this is a tongue twister. The SUCCESS Act was signed into law by President Trump on October 31st, 2018. It provides for a period of one year in which the USPTO is to develop and deliver to Congress a study on the participation of women, minorities, and veterans in patenting and entrepreneurial activities.

And let me highlight some of the key requirements of the study, as they are stated in the legislation. The study is to identify publicly available data on the number of patents annually applied for and obtained by women, minorities, and veterans. Per this provision, we are seeking to identify publically available -- that is, non-proprietary -- information that will allow us to characterize the participation of women, minorities, and veterans among the patent inventor population.

The study is also to identify the benefits of increasing the number of patents applied for and obtained by women, minorities, and veterans, as well as the companies that such individuals own and manage. Here, we are aiming to document the benefits, those economic, technological, and societal of attracting more women, minorities, and veterans to innovative
activity.

And, lastly, the study is to provide legislative recommendations regarding how to promote the participation of women by using veterans and entrepreneurial activities and patenting, particularly increasing the number of patents applied for and obtained by these underrepresentative groups. We are interested in documenting public policies and other initiatives intended to engender real change and effectively expand the innovation ecosystem to include more women, minorities, and veterans.

With these requirements in mind, we have developed and began fulfilling a SUCCESS Act implementation plan. We are consulting with the Small Business Administration as well as the U.S. Treasury Department and Department of Defense to compile richer information on underrepresentative groups among patent inventors. We issued a federal registry notice, commencing a two-month public comment period to compile information directly from individuals, companies, associations, and others.

In that federal registry notice, we posed 11 questions that are to provide a preliminary guide to aid the USPTO in collecting relevant information and to evaluate possible administrative and legislative recommendations that may be
provided to Congress. These questions, which I'm just going to read a few of them, include: What social and private benefits would you identify as resulting from increasing the number of patents applied for and obtained by women, minorities, and veterans? Should the USPTO collect demographic information on patent inventors at the time of patent application and why? What entities or institutions, if any, should or should not play an active role in promoting the participation of women, minorities, and veterans in the patent system and entrepreneurial activities? What public policies, if any, should the federal government explore in order to promote the participation of women, minorities, and veterans in the patent system and entrepreneurial activities? And what action should the USPTO take to address the participation of women, minorities, and veterans in the patent system and entrepreneurial activities?

During this two-month public comment period, we are holding three public hearings across the country to provide the public with the opportunity to speak publicly on crucial questions raised by the SUCCESS Act. Our objective at these hearings is to listen and collect as much information as possible from the public. Today's testimony will be recorded and transcribed and included in the official record for the SUCCESS Act. We will
convene our final public hearing on June 18th, as John mentioned, at our regional office in Detroit. We encourage interested parties in the Midwest region to participate in that hearing.

We also acknowledge that not everyone wishing to provide insights and recommendations relevant to the SUCCESS Act will be able to participate at one of these hearings, whether due to their locations or other constraints. Consequently, we will be accepting written testimony submitted via email until the comment period closes on June 30th, 2019. We urge those unable to speak at one of our hearings to contribute to the study by submitting written testimony.

All of the information gathered today and throughout the public comment period will be reviewed and incorporated into the materials we put together in response to the SUCCESS Act. The USPTO director and deputy director will be actively involved in this process as expanding the innovation ecosystem is a critical priority to the USPTO and our leadership.

Turning now to some logistics for today's hearing, myself, or Regional Director John Cabeca, will introduce each individual scheduled to testify according to the agenda. Each individual has previously indicated the duration of time they wish to speak. A clock is provided over here to my left to indicate to
speakers when that time has concluded. We ask that each speaker stick to their requested speaking times as much as possible to be respectful of the time and schedules of subsequent speakers.

After all scheduled testimony concludes this afternoon, there will be an open floor period for unscheduled testimony. Any speakers wishing to speak during their scheduled -- I'm sorry, wishing to speak beyond their scheduled time are welcome to come forward again during this open floor period.

We will have two sessions of scheduled testimony this morning with a break in between. We will then break for lunch and reconvene for a third session of scheduled testimony starting at 1 p.m.

With that, I'm going to ask John to come back and introduce our first -- any other logistics and introduce our first speakers. Thank you.

MR. CABECA: Thanks, Amanda.

So I just wanted to echo Amanda's comments with respect to today's logistics and add a couple more. One that may be of great importance is where are the bathrooms. So if you go through the door in the back and then continue straight around the guard's desk and exit out of that door, they will give you a badge with which you will need to get back in to enter through the side
entrance there; otherwise, you'll have to walk all the way around, and you don't want to do that.

With respect to the logistics for the hearing, again, I just want to thank you-all in advance for your assistance with helping us stay on schedule -- and thank you, Amanda, for getting us back on schedule -- and, also, to ask that you stay on topic. I think that today's topic is of such great importance that we look forward to hearing all of the views from the community on ways that we can improve the level of engagement and activities that we have with women, minorities, and veterans in the entrepreneurial-impacting space.

So just, again, ask that you try to keep your remarks to that topic. And also, Amanda mentioned the timer, so when we're about one minute -- in order to help us keep on schedule, when we're about one minute left from your scheduled time, we will chime in and give you a notice, just so you have a heads-up that you have a minute left, and if needed, to wrap up any final comments you would like to make. And, again, thank you for all of your help with that.

So the last thing I wanted to add is we also will not be taking Q and A throughout the event today, so, on the scheduled testimony, it will be made of record. We have a recorder here
that is tracking all of the testimony for the USPTO and the SBA to help them in developing a report.

So, as a result, we won't be taking Q and A, but if there is any comments that you would like to make, then we do kindly ask that you wait until the open sessions at the end of the day.

With that, I would like to go ahead and start our hearing and introduce our first speaker. The first speaker is Robert Granadino.

MR. GRANADINO: Granadino.

MR. CABECA: -- Granadino -- thank you, Robert -- who is the chief operating officer at inteliGlas Corporation. Robert.

MR. GRANADINO: Thank you. All right. Thank you, Director Cabeca, Directors Clowes, and Ms. Myers.

Ladies and gentlemen, my name is Robert Granadino. I'm the COO of InteliGlas Corporation, which is the world's leading artificial smart building platform in the world. Today, I'm really here speaking about my history with patents in my previous life. My background includes -- I have a BA from UC Berkeley in political science, and I'm a nine-time U.S. patent grant recipient as well. Back in May of 1992, my partner and I came up with a -- what we thought was a pretty good idea, and we developed the
popular standard for the ergonomic computer keyboard, which was licensed to the industry. We did that back in 1992.

My background, I think for today's discussion, how I fall in line is really I'm an independent inventor. I'm also a minority. My father was Mexican-American, veteran of World War II, had a background in the -- as an industrial designer in the Gemini, Mercury, Apollo, B-1 bomber program, working at North American Rockwell.

But today, really, I'm here to be a bit critical. All right? Because I bring 20 years of experience with our patents, defending our patent portfolio against some very large infringers, and it can be quite brutal out there. So I have got some ideas, I have got some criticisms, and I have got some recommendations for the USPTO. So I'm going to speak from that level.

Basically, I want to touch on five or six different areas. One is the imbalance in the disadvantage that independent inventors have. Women, minorities, veterans, they all fall into the same category if you're an independent inventor in the industry, the way it's currently set up to date. U.S. patents can be weaponized against independent inventors, that means women, men, you know, all sorts of minorities and veterans that, you know, come in to play here.
You also, as an independent inventor, from my perspective, deal with innate corruption in the system, whether it's with attorneys representing you or the other side, judges, even examiners potentially. I wish I had more time, I could speak to a lot of that, but I'll get into a bit of it.

And then I also want to touch on safeguards, safeguards that can be put in place, but without these safeguards, I don't think that asking women, minorities, independent inventors, veterans to get involved in the patent process makes a lot of sense because it can be, you know, very risky financially to go down this road. You know, part of it is the excitement, of course, of inventing, but the other part of it is really defending your invention when it's infringed, and that could be quite a daunting process.

So I do want to begin by saying something striking here which, in my opinion, I think U.S. patents from the United States Government is a terrible product, and I'll tell you, you know, part of the reason that this is, you know, not a good product is that there is an issue with validity -- a validity process that happens in the courts after a patent is issued that can really take it down, you know, a very difficult path as an independent inventor.
So let me talk a little bit about that imbalance here. As an independent inventor, as you, you know, are getting your first patents and apply to the marketplace, if an infringer comes along, you're required to stand up against that infringer if you think he's infringing your patent, and part of that process is to simply obtain legal counsel and notify the infringer that they're infringing on the patent. That can simply lead to predictable outcomes, which is, in part, a validity claim that's typical in the process where engaging with an infringer, typically what will happen is that the other side will say that a patent is invalid, it shouldn't have been issued. And this whole process that occurs here with these typical validity challenges can go on for years, and without adequate funding from an independent inventor, you really don't have much of a chance standing up against some of these big dogs in the marketplace.

And what I mean by that is simply that the typical strategy of a large infringer will be to run the independent inventor out of money. So the landscape basically that you're going into is just that. You're looking at years, hundreds of thousands, millions of dollars -- I see a gentleman laughing in the background; maybe it is that he understands what I'm talking about.
But this invalidity aspect is part of the Achilles heel of the patent system in obtaining a patent, and I think that that's, you know, from my personal point of view, unnecessary, sort of ridiculous. These patent invalidity actions through the statistics wind up to be 9 percent successful. That means, 91 percent of the patents are valid, but in these invalidity challenges, you could wind up in court, having a judge re-examine the entirety of the scope of the patent itself.

And, typically, this is what the attorneys, as well as judges will say. They'll say, Well, we have to go back to the very beginning of your patent. We have to examine everything within that patent to see if it was even valid. Of course the defense is going to be saying that it's not valid, there's plenty of prior art out there, and so on and so forth. So this strategy can really drain the funds of an independent inventor quite handily, and that is the strategy.

So this is also -- I just want to sort of lay into or describe a little bit about the high risk that is involved in defending your patent. So it may sound, you know, fairly flaccid at this point in time. Okay, so you have to deal with some attorneys that claim that there's, you know, not validity within the patent itself.
And then, you know, after you get through all of that process, which can be years, then you wind up talking about the infringement. And typically, the judges and the defendants will say that and recognize that, that you're not going to get around talking about the infringement question until you get through the invalidity question. And that invalidity question can exist at court and it can also be thrown back to the USPTO. It can be thrown back into it under a re-examination. So the threat to the independent inventor during this process is that they're going to lose the patent, and during this process of, you know, negotiation with the infringer, the infringer is basically saying we're going to take your patent away, and then you're going to wind up with nothing. All right? So how about if we cut a deal on pennies on the dollar and you walk away from this?

That's difficult, right, especially if you put a lot of time and effort, research and development, and you believe in your patent, you know that it's infringing, but you have questions. You don't know what you don't know. You don't know where the prior art was. You know that it was examined by the USPTO and that you had to go through a pretty rigorous program to get yourself to this point, and now you're having it all questioned once again.
And then the dirty side of it is that, if you withstand all of those challenges and you get through the -- get up through the question of infringement, then you're dealing with the potential of losing the case. And if you lose the case -- and this is what has happened to my partner and I -- the threats of holding us liable for attorney's fees and costs are real, especially when you're dealing with millions of dollars.

A friend of mine had a water balloon patent that just recently settled out, and reportedly -- I think it was the "L.A. Times" or the "New York Times" reported on this -- the defendants in this case spent $20 million in outside legal fees for attorneys. And this is relatively, you know, a small-type product. The revenues reportedly from the company for the water balloons was $100 million a year. And from the perspective of the inventor, that's his money being used against him in this case.

So what I want to say is that, at the end of this, there are even defenses that will threaten to pierce the veil, if you have a corporate LLC, to pierce the -- threaten to pierce the liability -- limited liability aspects of it and go after the inventor personally.

So how does that happen? Well, it happens that, if you drain your funds and fighting and defending your patent and your
LLC doesn't have any funds left, the defense attorneys will turn and say, "Well, somebody's got to pay the defense fees here," and they have got a defunct LLC, so they'll attempt to go after you individually by piercing the veil.

So these are some of the tactics that go on. So when we take a look at getting minorities, women, veterans, typically, I think we think of that as independent inventors. We're not talking necessarily here -- at least just my interpretation -- that we're not talking about corporate invention. I mean, certainly, it's noble to get, you know, folks in a corporate environment who are in this class to participate in patents, but, you know, that's -- to put it in the vernacular -- not where the money is. Right? It's a pat on the back and maybe a small bonus, but it's not -- you know, it's been my experience, working at some of the very large corporations, that they don't have programs to really reward inventors.

So we're really talking about independent inventors. And in order to make it worthwhile under the first -- under this construct, you have to talk about very big dollars. You know, the type of dollars that we were talking about in our cases were tens of millions of dollars, in excess of $50 million. And it would only make sense because, at the end of the day, if you win, you
know, you win something below that amount, well, the first cut
goes -- if you're in a contingency with your attorneys, the first
cut goes to your attorneys. The second cut goes to paying all
those expenses of experts and court fees and everything else that
go along with it. And then, after that, that's where you get your
cut. So the dollars have to be big because the risks are very
sizable.

So with two minutes left here, I have some
recommendations. All right? And, you know, I know that these
recommendations may run in the face of, you know, the going
standard, but I would say, if you want to get -- if USPTO wants to
get independent inventors involved -- women, minorities,
veterans -- you're going to have to take a look at this validity
process. In my opinion, you know, anything that's fair during the
examination process of a patent, all the way up to the point that
it is issued, but the patents don't have any teeth currently. So
if you take a patent out, you know, the other side simply laughs
at you now because everything has to be re-examined once again.

So I would recommend that statutes be crafted to end the
validity issue prior to the issuance of the patent itself. So
anything that -- any challenges that want to be made during
that -- and up to the point of the issuance of the patent would be
gained. Anything after that, you can't talk about, you can't raise issues or make claims about invalidity at court or, you know, re-examination or anything else post issuance.

Now, what would that do? That would simply, you know, take, in large part, this phony argument -- again, only 9 percent are successful, so that means 91 percent of the patents issued are valid. It would take this weaponizing of the legal funds to get that out of the way and then go straight to the infringement question. And that's the important thing is talking about whether or not this product in the marketplace infringes your product and have an instrument in the patent itself that has some real weight behind it and some real teeth; that if an infringer decides to infringe your patent, they're not laughing at you, that they're actually quite concerned.

So with that, I'll come back.

MR. CABECA: Thank you, Robert.

MS. MYERS: And now we'd like to invite Cecilia Corral -- Corral?

MS. CORRAL: Corral.

MS. MYERS: Corral. Cecilia is the co-founder and VP of product at -- CareMassage or CareMessage?

MS. CORRAL: CareMessage.
Thank you all so much for having me here today, and thank you for the U.S. Patent and Trademark Office for just providing this forum for us to share our thoughts on how to get more women, minorities, and veterans involved. I noted the call for the commentary also posed a few questions surrounding entrepreneurship, so I wanted to take today to talk about my path both as an entrepreneur, as an inventor, that sits at the intersection of gender and race, but I also want to place a special focus on the important issue of socioeconomic status. I think the intersection of these characteristics place people from underrepresented backgrounds at a higher disadvantage than more affluent individuals, even when they both identify as women or minorities.

So I'll take today to highlight a number of my personal challenges and the opportunities available to people like me the in K through 12 education, higher education, and in the tech industry in hopes that it can spark some ideas and ways we can better support women, minorities, and veterans throughout their journey.

So my name is Cecilia Corral. I'm the co-founder and VP of a product at CareMessage. We're a healthcare technology non-profit that helps connect underserved patients with healthcare
organizations using text messaging. My family came to the United States from Mexico when I was one year old with nothing other than the clothes on our back, and I grew up in the Rio Grande valley of Texas. We relied very heavily on food stamps and medicaid to make ends meet. My parents sold goods at a local flea market.

Over 90 percent of my community lived in poverty, and no one I knew had gone to college. When I was in high school, I looked around and I realized that I wanted a better future, and my parents encouraged me to continue striving for more. So in my junior year of high school, I became a guinea pig for a new program aimed at helping high school students obtain an associate's degree in engineering before their high school graduation. This program played a pivotal role in my acceptance to Stanford University, where I went on to obtain a bachelor's degree in product design engineering.

So when thinking about how educational opportunities enable someone from the minority group to pursue entrepreneurial activities, I encourage you to look at early college high schools and dual-enrollment programs. These programs in South Texas led a partnership between local school districts in South Texas College have provided a bridge for students from low social economic backgrounds that would have never been able to afford going to
college. And I think the seed needs to be planted in our K through 12 education to show students very early on that they have options available.

So after graduating from Stanford University, I made my way back to Texas to study chemical engineering at the University of Texas at Austin; however, I was the only woman and the only Latin-mixed person in my classes, and I had a really hard time making my ideas be heard by my classmates. During a class project, we were tasked with creating an assistive device that could help children and adults with mobility issues fold laundry.

My innovative idea was to take what I have learned from my brother and my sister's experience in the military to roll laundry instead of folding it. I designed and built a device that was sturdy enough to roll all types of laundry, from clothing to bed sheets.

At the time, we considered filing a patent because no such device existed, but when we started to talk details, it was very clear to me that my original idea was being appropriated by the male team members, and I had no support from male faculty to ensure my contributions were not pushed aside.

My male advisor then told me "boys will be boys" when I tried to advocate for myself and the fact that my male peers have taken my ideas and marketing them as their own. So, at the end of
the day, I killed the idea of filing a patent because if I wasn't
going to be first inventor, it felt worthless.

Microaggressions are sadly a regular occurrence for
women and minorities in academia and the workforce. I believe
educational institutions, like the University of Texas at Austin,
should be held accountable for the environment they create, where
women and minorities do not feel welcomed. I encourage you to
think about a reporting process that would allow inventors to
report privately or provide proof of being first inventor in
situations where sexism or racism is preventing them from filing a
patent.

So after being frustrated by my experiences in graduate
school, I decided to drop out and co-founded CareMessage. At the
time, I really felt like I had nothing left to lose, that I didn't
know well enough the challenges that came with entrepreneurship to
be discouraged. So one thing I did learn very early on was I was
going to continue to be the only woman in the room.

It's no surprise that the tech industry in the United
States is the problem with women and a bigger problem with
minority women. In 2013, Tracy Chow bravely forced the industry,
who acknowledged it had a problem with higher and retaining female
engineers, by simply gathering data. Over the years since, we
have seen little to no movement from large technology organizations like Google, Facebook, and Microsoft. All of them have less than 50 percent women and Latin-mixed employees in the single digits.

I believe this needs to change and technology companies should be penalized for not showing improvements at diversifying their workforce, particularly in critical areas of product design and technology. By excluding women and minorities, they have limited these populations' ability to generational wealth and participate in the creation of novel ideas.

On the venture capital side, the progress is equally weak. According to Crunchbase, 17 percent of venture funding is funded to companies with at least one female founder, in contrast with 83 percent to only male founders. Most of the excuses from the venture capital world and the tech industry are the same; that we women Latinos simply do not exist, so we can't be hired or funded.

In 2018, I decided that I have heard enough excuses, and I set out to find Latino founders myself. So over the course of a few weeks, I was able to identify 50 Latino founders and have raised over a million dollars in funding. This year, my list reached 100.
So let me be clear, these women have been here all along, but for some reason, they were never given the same level of disability or funding as other founders. What I learned from collecting this data is that it's helpful to shine light on the problem and showcase founders as a way to aspire others to see these challenges can be overcome.

Lastly, tomorrow, I will issue my first patent, Patent 10,311,535, on the use of text messaging for health coaching. CareMessage is a non-profit organization, and although a number of our competitors in large organizations are infringing on our patent, we had actively decided not to defend it mainly for two reasons. Number one, in the tech industry, when a small company tries to defend the work, it's labeled as a patent troll, and this is something that does not align with the values of our company. And, two, since we know the process to defend patents is broken, we think it would be a waste of our limited resources to get ourselves into litigation with companies that are much larger and better resourced. We are very proud of our innovative work, but sadly, are currently patent system turns these innovations into something we can only showcase and talk about, not enforce. I hope my story helps shed some light into the multiple barriers that prevent women and minorities for participating in
the patent and entrepreneurship ecosystem. There's value in
having data about this problem at different stages to be able to
force the necessary conversations of social justice issues that
have plagued this country for centuries. We're a melting pot of
people that we are here before and came from across the world, and
I think it's our duty as a nation to boast freedom and opportunity
to ensure that all people have the same opportunities to build the
innovations of tomorrow.

So, in summary, I have five summarized recommendations.
The first is to fund education programs that provide opportunities
for low-income students to find their path into STEM fields while
in K through 12. These programs provide students with the
confidence and skills they need to succeed, and I think they play
a key part in helping people from underrepresented backgrounds and
poverty.

The second is to provide a way for inventors that lack
the resources to file their patents and defend their work.
Unwelcoming environments in academia and the workforce are pushing
women, veterans, and minorities out. For people that come from
low socioeconomic backgrounds, the constant lack of resources is
likely a reason why patents are not filed in the first place.

The third is to hold the tech and the venture capital
industry accountable for the demographic background of their workforce and leadership positions. This should apply to everyone from small 10-person start-ups to multinational corporations where they're putting their money and their resources directly impacting (indiscernible) to invest in innovation.

The fourth is to gather data on patents filed by women, minorities, and veterans. This is critical for accountability and to measure progress. And I think, when gathering this data, ask people to self-identify instead of making assumptions. Latinos come in many different forms because we are a mixture of backgrounds. You can't simply go off of someone's name or skin color. Being asked to self-identify is not intrusive as long as you are clear about why you're asking for this information, provide an option to opt out, and you don't use this data to evaluate if a patent is issued.

The fitness to provide disability to those of us who are already here, because you can't be what you can't see. Like with the tech industry and the venture capital world, my guess is that you will have a lot of women and minorities like myself that have been awarded patents or in the process of being rewarded one. I recommend that you invest in marketing campaigns that share those stories throughout the right channels so we can inspire other
inventors.

So, in closing, I think patents are a mark of innovation, but without enforcement from our government, they will continue to be generated only by those that already have the means to do so. Along the way, women, veterans, and minorities face multiple challenges that deter them from entering the entrepreneurship ecosystem. We need baseline data to understand how big this problem is, and we need measurable strategies and results to ensure we provide equal opportunities for women, minorities, and veterans to participate in creating the innovations of tomorrow. I think that by increasing the number of women, minorities, and veterans that participate in the entrepreneurship and patent system, you will enable the people from these communities to solve the critical problems that are important to them and the people that are like them.

For me, that innovation has meant helping underserved patients to improve their health using mobile technology. Thank you.

MR. CABECA: Thank you very much. We'd like to introduce our next testimony, and that will be delivered by Stephanie Couch, who is the executive director for the Lemelson-MIT program at the MIT School of Engineering. Stephanie.
MS. COUCH: Thank you. I am an education researcher who has been, for the last three years, trying to understand what is the pathway of an inventor. And so I will lead you to a copy of a new publication that just came out, special issue from the National Academy of Inventors; it has a number of different articles on invention education as well as a detailed answer to some of the questions that you raise in 15 minutes, but I don't think we can touch on everything, so I'm just going to just highlight a few things.

First of all, our program, the Lemelson-MIT program, has been trying to inspire young people across the nation to pursue creative and inventive lives for 25 years. One of the ways we do that is we give a $500,000 prize each year to a mid-career inventor who has done something significant in the world in order to have someone to raise them as a source of inspiration.

We also search the nation and give prizes to college teens that have created inventions and graduate students who have also -- engender the spirit of creativity and inventiveness, and we give those awards to the students in four categories: Cure it, use it, eat it, and drive it.

And so when I look at the students who won the prizes and what they have invented, I think there's a lot of good data
there, as well as those who have applied for those prizes, to look at what are the possibilities if we had more diversity in the patent pool. We can look at what things have been created and brought forward. But we have not analyzed that data in that regard yet but we could.

But I have been working to analyze information from the invention education programs we have offered with high school students and middle school students for the past 15 years, and today, I want to talk more about what we have learned about the development of inventors in the high school years. We have worked with 450 high school teachers, provided them with professional development, and then we have provided grants to 243 high school teachers and teams of students -- there have been 2,750 students participating over the past 15 years in 43 states, and the most grants have been awarded in California, Massachusetts, Florida, New York, Oregon, Texas, New Jersey, and Virginia, and eight of the high school teams have received patents for their work.

So a number of the questions that you have raised for this hearing can be answered through the research we have been doing on the work with the teachers and the high school students. Question 6 asks about the educational and professional circumstances that affect the ability of women, minorities, and
Based on our experience, we think that the opportunity for young people to learn to invent is especially helpful if it is in a team-based format with differentiated roles. A lot of times, the young women who come to these teams come because they're going to be the team leader, they're going to be the communications person, the project manager, and along the way, they discover their skills and capabilities in the STEM areas, and at the end of this year-long experience that they have, we can see that their interest, their confidence, their desire to persist in STEM college and career pathways falls out from that team-based experience.

I think if we ask them, you know, do you personally want to come invent a solution to a problem, they would, maybe in the beginning, wouldn't feel the confidence, but by the end, these young women that were interviewed would say, Oh, heck yeah, I'm an inventor, and here's what I'm going to invent next. And so we see the power of the experience.

Question 7 asked about the socioeconomic factors that facilitate or hinder the ability of women and underrepresented students. And, you know, again, we have end-of-year experience
data from 15 teams a year for 15 years, but recently, we have been
doing case studies and I have looked at three young women, three
young men, and I have compared what we can get out of our
ethnographic interviews. And what we see is that the young men
have had a lot of experiences, all the way from back in
kindergarten in after-school programs like robotics, they have
someone in their home who has been talking to this from an early
age. A lot of times, these ways of inventors are passed down
through families. We see them participating in experiences and in
school, whereas the young women who are coming into these teams
and having these experiences, this is the first time. And so that
dovetails with, when we bifurcate our end-of-the-year experience
data why young women and students from underrepresented
backgrounds are rating much higher than the others what they have
gotten from this year-long experience because they have not had it
at all through their years of schooling. And so it really speaks
to the comment of a prior speaker of needing these experiences to
happen by design in the K-12 years.

Question 8 asked about the entities or institutions that
should play an active role. In the model that we developed all
through the school time, the K-12 schools get involved, colleges
and universities get involved, STEM professionals in the community
get involved, and rank-and-file people who have problems that need
to get solved get involved. And it's the student being able to
pick, not happen upon, where a problem is given to them that they
have to solve but where the students get to pick by conversing
with people in their community and find something they personally
care to solve that makes it a lot of the difference. So all of
these folks have to be involved in an ecosystem-driven model.

Question 9 asks about the policies that the federal
government should explore, and you know, we have been able to do
this work because we're founded by a family foundation. The state
and the federal education policies and funding formulas do not
support this kind of work. We do not fit, which gets to one of
your last questions about policies that hinder.

What happens now is our education standards, for
example, in science and engineering, they lay out a linear
progression of scaffolded learning of particular concepts and
practices that grow year by year. And when we form teams of kids
and they pick a problem they want to solve that means something to
them, we cannot say that you're going to learn a particular
science concept that's appropriate for 11th and 12th graders.
You're going to learn science and engineering concepts appropriate
to the invention.
And if we allow that to fall out, there is meaningful STEM learning taking place. I'll give you an example of how this works. So one team that we have had is one of many examples. It was a team of young Latinos from Southern California where an after-school leader recruited them from their high school math class. And this team of girls decided that the problem they wanted to solve was their homeless moms would get cellphones from the county, and they need to be able to charge them. So the young women invented a solar tent that would charge the cellphones. So you can see how they're drawing on something that meant something to them, was close to them. We asked them how did you come up with the idea, and they said, we're just one paycheck away from that. We asked them how they learned to do the coding required, and they learned by watching videos on their cellphones, and they describe their iterative cycle and how they wanted to give up, and yet, they persisted until they could get it to work. Again, that kind of experience changes lives. And I cannot say you're going to learn the types of environmental science problems that we specify for 11th and 12th graders, because that wasn't an environmental concept, it was different. So that's why we need to be able to put this type of
strand of learning on the school day with educators supporting it, but it may not fit exactly what we have today. You can make the claim this is a great career or technical education strand in the school day and workforce development, yet when you look at those funding sources and strands as well, they tend to be specific to a particular industry sector, and this kind of work is transdisciplinary, it cuts across sectors. So we really need -- if you're going to consider a workforce, it would be an invention and innovation strand that cuts across all industry sectors.

So we have some work to do on policies, and I'd love to share more if you decide to dig in deeper in your final report.

Let's see.

So I think one thing that could be especially helpful is if you were to look at models like ours. We have run across other models from other colleges and universities in our work. Some of them are documented in the journal, which I'll leave you a copy of that. But, regardless, because teaching the process and practices and ways of thinking as an inventor are so different than teaching a science and engineering class or a math class, we probably need to start with a handful of centers that could do this kind of work in our communities, grow the models, and grow the kinds of programs that you need to orient K-12 teachers to teach in this
kind of way. In our research, we have been studying the students and the impact. Now, we have been studying the educators who carry out these kinds of work with their students and found that 67 percent of our teachers last year had a career in industry prior to teaching. So that, at least, gives us some clues as to, you know, the kinds of teachers who may, with a little more experience, can be especially good in creating these kinds of systems that need to exist and then we can -- after we grow a more formalized system in selective regions, the state can grow that out.

Let's see. This is still a hard road to go down, but we have found that we have been effective at being able to get young women to participate in these kinds of invention education projects. 35 percent of our students have been female. And our percentage from underrepresented backgrounds varies from year to year. In 2017, it was 44 percent. In 2018, it was 29 percent. So, you know, we still have work to do, but it is an effective approach, especially given the numbers that were cited in the beginning of the hearing. And I do think that a lot of the motivation to participate comes from the desire of young people to be engaged in meaningful work that helps people and changes lives.
And, you know, again, in the ethnographic interviews, some of the students were telling us this was the first time that they felt in their life that, as they engaged with the community around the problem, as well as getting feedback on the design of their prototype, that this is the first time they had a meaningful conversation with an adult.

And so I think there are lots of benefits that can come from an invention education strand in K-12 that would go alongside what we otherwise teach, and some of that just has to be about a social-emotional learning benefits. They go through struggling, persisting, coming out the other end with something you have created and connecting with members of your community.

MR. CABECA: Thank you.

MS. MYERS: Now, I'd like to invite up Professor Colleen Chien up to the podium. Professor Chien is from Santa Clara University School of Law and Columbia Law School.

PROFESSOR CHIEN: Good morning and thank you so much to the PTO for having this meeting today and to everybody for being here. It's my pleasure to testify a little bit and use my time. I come out from academia and research, where I have been spending the last 12 years trying to use patent data to advance innovators that patent but not just have an innovation and have a chance for
me to come up and reflect a little bit on this as part of this historic effort today.

So I want to use my time to make three points based on trying to work with patent data and also try to understand the various drivers that are contributing to the current gaps, and I would say underutilization of our country's talent. And this all took off from my work in government where there was a real effort when I was in the Obama Administration to really think about innovation for all, by all, and to really think about all the untapped sources of talent that we have a challenge to try to bring forward.

So the three points I want to make are about, first, the particular moment, how we place that in the patent system's long history and commitment to advancing innovators and not just innovation. And I just wanted to place that into context because this moment, I think, is part of a longer conversation that will continue that has been about this topic and about the democracy -- democratization of innovation that is particular to the U.S. patent system.

The second point I want to make is about the PTO's particular comparative advantage as an aggregator of information about innovators that has really come to the fore. The study that
was cited earlier by Raj Teddy (ph) is extremely influential,
what's going on patent data. There have been numerous studies of
innovators that have begun using patent data and it's to the PTO's
credit that they have done work to make this data available but
even more could be done to collect and disseminate and federate
data about not only demographic traits but socioeconomic traits,
and really, I don't think there are other agencies or institutions
that can do as good a job, so that puts more pressure on the PTO
to continue to try to improve what we know and what we don't know
to try to fill the gaps on what we don't know about the trades of
inventors.
I'd also call on the PTO to do what only it can do,
which is to experiment and test for implicit bias as has been
suggested in the literature a little bit.
And, finally, I'd want to call upon companies that may
be here or involved in this conversation to work with the PTO, as
it's called by the SUCCESS Act, to uncover practices that work,
that can actually increase inclusion and diversity by supporting
survey work and research and try to think about how the regional
offices contribute to that, so I'll talk a little bit about that.
So I'll provide brief testimony separately, so I won't
go through all the different sources, but if the PTO has specific
questions or others come up, the comments here below -- comments that I'm going to mention draw from several research projects. Again, as I mentioned, a multi-year project on the use of patent data to advance innovators, and in that work, I have looked at patent data but also innovation data in publications and LinkedIn and other databases, and so I can speak to the comparative strengths and weaknesses of patent data relative to these. Another project is on rigorous policy highlights, article of the same name that's forthcoming in the Iowa Law Review, and it talks about this kind of process of iterative experimentation and evaluation by government agencies, including the use as PTO to deploy, develop and test and continuously approve policy and prevention. So, again, some of the things I want to talk about involve iteration and going back and forth and just as we're here in Silicon Valley where agile product development is widely used, you know, on a frequent basis, I think we can employ those same tactics to develop the policies that we're going to apply for at this very important set of issues. So I first want to go to my first point around the use of the patent system to advance innovators because we typically think of the purpose of the patent system, if we go back to the Constitution, is really to promote the progress of science in the
useful arts, but I would also -- it put before that it's been
fundamental to our U.S. patent system that we think about
having -- advancing innovators -- think about advancing innovators
as part of that.

So if you look back in the history, to the early patent
system, there were many distinctive features that were meant to
courage participation and inclusion in inventing. So unlike the
British system, we had a system that was based on merits and on
patronage, the ability to accept applicants by mail, and so it
wasn't -- you didn't have to actually go to the office and have
that relationship. We also had low fees.

So these were all features that we're going towards at
the very foundation of the system, the ability to include low
income, rural inventors, inventors with good ideas, not only good
connections. Decades later, we have had this commitment to
inclusive inventing come through as Congress has introduced fees
for small and non-profit and individual inventors, and then in
2011, with the America Invents Act, introduced the micro entity
inventor status level, and at even lower rate and creating
regional offices for -- in Detroit, Dallas, Denver, and here to
offer services to make sure they weren't just on the coast but
disseminated around the country.
So I believe, you know, the work that's being done here is very important, and if there are interventions that are working, I believe, Congress is going to be very receptive and interested in what they're about.

So I wanted to just provide that backdrop to place today's SUCCESS Act hearings as this ongoing partnership and thinking about how to close the gap.

So this brings me to the second question of, well, how can USPTO in particular play a role and what has been its role historically. Here, I want to point to you the important and comparative advantage the USPTO has as aggregating information, and that means collecting and disseminating and federating information. And I want to commend the Office of Chief Economist in particular for its efforts thus far as applying a rich and detailed view of innovators of that patent.

So when you look at a patent, though, you have not only the information about technology that's inside the patent but on the front page, many, many details about the setting of the patent, where it was created. When you go into the patent record and look at the fees that were paid, you can see what the entity status is of the assignee, you can look at the setting. And so, with this, you have a lot of rich information about innovators,
not just about innovation.

But for many years about this data, although it was being collected, has been locked up because it was dirty. It wasn't able to be accessed electronically. Also, you have people using different names when they sign up for patents, and so that hasn't been allowed for comparisons across time.

But thanks to the work of the chief economist as well as in a set funding, there has been a lot of work to put that together, and that gives the patent data just a level of richness that is not available when you're thinking about survey data, which is some sort of episodic and ask different sets of questions. When you think about publication data, new product data, all of these different sets are generally in different types of silos of information, different forums. They're not uniformly reported in the same way that patents are, and this provides a lot of richness that is not available in other ways.

But this also puts a greater burden on the PTO to make sure that the information that is provided is accurate, and also, I think, can be connected to other types of information, just not on innovation, because when people talk about patent, they say, Well, the problem with that is that most innovation is not patented, it doesn't capture a lot of information that's out
there, and it's also not connected to commercial activity necessarily. You can apply for a patent, do nothing with it, or you can apply for a patent and it could become disseminated widely, and both are reflected in the same way in the patent system.

So I think the patent office should continue to think about how to situate its information, make it leveraged more broadly by, for example, trying to encourage people to draw ties between patent data and other data, to understand what kind of discount rate or what kind of way can we think about patent data in context.

And then also to think about how we can overcome certain deficiencies that we think are still there and prevent the full use of the patent data.

So I want to talk about, first, entity-size data. We talked earlier in this hearing already for comments made about socioeconomic status, and right now, the PTO does have little silos of information, but they're not put together, they're not available, and so this entity-size data that could be a rich source is, per the report, is not consistently available, and I don't think, as a result, it's being used as widely as it could be.
So right now, you have different-sized entities: Micro, small, and large. That information exists in the maintenance fee and the patent office has put that -- made that available through Patent View but it's not easily available. It's not consistently available. I have tried to use it many times. It's not necessarily there in the applications data. There was not a single snapshot that's easy to access.

So I encourage the Patent View field of entity data to be made available and also made available over time so that it can be traced.

A small entity category also includes the smallest inventors to the largest universities, so you have, unfortunately, in that entity a tag -- some noisiness, so I was encourage, again, the PTO to take some of the other data that's collected on whether the data came out of a company or came out of a non-profit or a government. And I know that work has been done before by the PTO in terms of collecting entity type. I encourage that data to be made of high quality. I have seen that there are some inconsistencies in it but also federated within the data so we can actually get a full picture of what -- who exactly is patenting where.

And there are independent researcher efforts to do that.
type federation, but if the PTO does it, it's a lot more accessible, it's widely available to everybody who wants to do the work, not just the researchers who have the most resources, who may or may not share the information and would encourage that to be collected in a more uniform and meaningful way.

Here, also, it's really encouraging to see the SBA work with the PTO because the SBA has a lot of rich information and other data available around, you know, the demography of the actual entity itself, if it's a business -- minority-owned business or what its income or revenue might be.

And so I would encourage -- I know that there has been efforts behind-the-scenes in the office of each economist to have PTO data sort of connected with NET's (ph) data and other data, and I would encourage -- I think researchers are very interested, I think, in looking at that data and would encourage the PTO to look at arrangements made by the census or other groups to create data-sharing agreements with researchers so that they can get access to information and they can see their questions and see if there are ways that there can be collaboration.

I think the addition of gender data is extremely helpful. I'm really happy to see the PTO not only making the report but then also immediately making the data available to the
federated and to the assignee database. It allows for some of
this tracking that was carried out -- Project Conclude was
referred to earlier, I believe.

But this could also be improved because the foreign
names are often not profiled in a way that -- with a high level of
confidence. And so, here, what I found useful in my own efforts
to try to profile better names and match it to gender more
conclusively is to actually use the native language and to go back
to the patent filing that is in the home country and is filed in
the native language. And so I have been able to overcome some of
these challenges by having native readers read native names. And
so if that were possible in the ADS to actually report names, not
in an Anglicized name but actually in, you know, Chinese or in
Arabic or some other language that is the home language, that
could improve the data that we capture, and therefore, the
inferences that can be made.

Race data is extremely challenging, especially with
respect to particularly African-American and White names, so, you
know, I think that we need more effort needs to be done to try to
think about this, in Lisa Coke's (ph) work, in creating databases
of African-American inventors and others, I think, can be brought
to bear. There have been independent research efforts. So I
think the PTO can -- has a great convening power in bringing
together some of these efforts and putting that and making that
available in the record.

I know my time is almost over, so I'm going to just take
another minute or two to mention that I think there are certain
things that the patent office can do that the private sector
cannot. One is around testing for implicit bias in patenting, and
this perception of reality that there is a lower grant rate to
women, which might be explainable by different factors, but the
work by Jensen and others from Yale has suggested this is this
gap, and the PTO has done efforts to try to understand how much of
that is due to external factors due to where the, you know, filing
in certain classes which have a lower grant rate, etc.

But I think, at the end of the day, the patent office is
in a much better position than the private sector to try to really
get at the bottom of this. And the way I would suggest that it do
so is by using a blind study, a randomized control trial. And I
just, last Wednesday, held a -- or Thursday -- held a workshop
with federal agencies across the government that were involved and
engaged in rigorous piloting and doing randomized experiments.

So I would encourage -- even though it seems like a
strange thing to do -- the idea of having a single application
with two different names on it and seeing if there's a difference in treatment would be an important first step and low cost relative to other interventions with higher-quality data to get at this issue of implicit bias. I'm happy to talk more about that.

The final thing I want to say is that there are areas of success in innovators that are participating, in companies who achieved a higher rate in sectors. You talked about companies that are at the top. They're really calling on the PTO to work with those stakeholders to ask them what has contributed to their success. Again, you have a different convening power of bringing them together and asking them to share information, which otherwise might be seen as something they want to keep proprietary or something that they, themselves -- you know, it's working for them individually, but they don't understand what the value to them would be of sharing that more broadly.

But we do have this, I think, shared interest, and I think just having -- calling upon companies to share information, participate in research, I think, could go a long way. Thank you very much.

MR. CABECA: Thank you, Colleen.

Okay. So, amazingly, we are ahead of the schedule. But since all of our other testimony is scheduled, we have an extra 15
minutes. So I thought I would offer, because the other
unscheduled public testimony, the open floor, is scheduled for
later this afternoon, I thought I would take this extra 12 minutes
that we have to see if there is anyone that is not currently
scheduled on the agenda that would like to provide any remarks.
Otherwise, we'll have a little bit longer of a break.

So if there's anyone that would like to provide open
floor unscheduled testimony, come up to the -- yes, thank you.
And please recognize yourself for our court reporter into the
microphone. Thank you very much. And 12 minutes or so.

MS. WESLEY: Kimberly Wesley. I'm a registered nurse at
Valley Nurses Association, and I have a patent pending for a
chemical composition that would be utilized as a sleep aid. I did
benefit from the micro entity program that was. That was
excellent. But one recommendation I might make is that support
and access to laboratory equipment, we have Stanford and Berkeley
and a lot of universities in the Bay Area, but small inventors
like myself, we don't have access to those laboratories and that
support and those resources.

So if the Government could develop an incubation
laboratory on the level of Stanford or Berkeley, it would be good
for us independent inventors. So that's all I had to say.
MR. CABECA: All right. Thank you very much.
Okay. With that, let's go ahead and take our break.
We'll convene back here about five minutes to 11 if that's okay,
10:55. Thank you. And, again, if you need to use the restroom,
please see a guard for a pass so you can get back in. We'll
reconvene at 10:55.
(A brief recess was taken.)
MR. CABECA: Okay. Returning from our break, thank you,
everybody. It's my pleasure to introduce our next presenter and
to provide his testimony and -- so we have four speakers coming up
over the next hour, and then we will break for lunch for an hour.
Lunch is, unfortunately, not being provided but there's a lot of
places nearby. Also, if you would like to grab your lunch and
come back, you know, we have room in the lobby, and then there's
also a little conference room where we can sit around and
informally speak during lunch. So, again, it's on your own, but
you would like to bring it back here, we welcome that as well.
Okay. Moving on to our next testimony, Sheng Tai "Ted"
Tsao will -- he's the president of STT WebOS, Incorporated, and
will be providing his remarks. Thank you.
MR. TSAO: Thank you, everyone. I'm Sheng Tai Tsao; you
can call me Ted. I'm a Chinese minority, U.S. citizen. I have a
master degree in computer science from Cal Poly at Pomona in 1988.
Since -- from 1988 to 2002, I worked as software engineer in
Silicon Valley for many -- several high-tech company, and so my
story is, since March 2002, I have funded in my own start-up
company called STT WebOS, Inc., and also in this year, I have
solved, you know, web browser blocking problem, so that actually
achieved the web multitasking.

So, in August, I had filed first patent application for
the -- this technology. Starting from 2008, I have received that
numerous patent for this technology, along with the other patents
for other technology. And of course STT would like to license the
advanced technology, so this journey is a study from 2002.
November 2002, I have sent several letters to multiple high, you
know, tech giants and introduces web multitasking technology.

And so SBA for looking for partnership or investment or
licensing opportunity, and on December, I fortunately got response
from first tech giants, and so -- but the response investigates
finally reject, you know, that kind of intention -- good
intention.

Now, I still feel warm about it because at least I got a
response, while other tech giants even never bother to response.
So, from 2005, that's the first several years, Silicon Valley
companies studied the -- called Ejects (ph) technology (indiscernible). So then, in 2008, I just -- you know, sent an email to the first tech giants telling them, say, okay, look, yeah, this is Ejects system, major issue is solved with, you know, web multitasking problem -- I mean, solving the web browser blocking problem. Web blocking means, when you interact with your web browser, no response. You (indiscernible) create no response, and you have to wait. After a while, then response.

And I tell them, they said since, you know, they try to, you know, give me a warm response, introduce some internal staff, and actually, they are still no way to move to that licensing board in a good intention even without purchasing. Right?

So nothing each -- you know, so what are we planning to do. Now, from 2015, an attorney who attend the STT for licensing activity, this time, you know, we captured many chem giant. Same because they said chem giant to first -- for first tech giants in U.S. and China. And so this chem giant also send it to the first tech giants. Yeah.

Now, in 2016, after one year long discussing and a challenging conversations a meeting, there are second tech giants in Silicon Valley, finally, you know, license our technology. That's about more than 40 patents in different area, including the
web and multitasking. And this is the first one and there's the
only one licensing (indiscernible) since 2002.

So, in 2016, of course other multiple tech giants, first
in China and in the U.S., including the first tech giants to study
the serious conversation with attorney. And, unfortunately, in
September 2017, four patents, among more than 40 patents, have
been embedded in the case by district court on a (indiscernible) B
6. And that means without claim construction, they got a quick,
invalidate.

So after that invalidation, all tech giants, you know,
they are all suddenly started a conversation with the attorney.
So since -- in 2002 and in 2018, STT came out January any revenue
from, you know, licensing.

So up to this point, STT still working hard to try to
licensing its -- you know, the advance of technology and also
wondering when the first tech giants would take step toward
licensing. And we are not looking for skyrocket, you know, in any
for licensing fee. It's very modern. It's -- even, you know,
penniless, you know, price for putting license, you know, use of
contact. This is like a fraction of a penny. You know, I don't
know. If they are sued, the tech giants where the licensing our
technology.
So my question is -- first question is, can the four patent be recovered from session first invalidation because, since the 2018, federal circuit has issued that multiple and new case law for preventing first invalidating the patents. Also PTO has a new guideline for examining for the patent invalidation, so -- and this is new case law and the new guideline, you know, the four -- the four patents can never be unvalidated.

So the second question is why is long established innovative technology, such as web multitasking, from a small inventor or individual inventor has extreme -- tough time for licensing to tech giants? Now, the question is: Can our legislation, our judicial system, or PTO help small inventor or individual inventor to licensing their patented technology for much easily to the tech giants. Yes, that's all I wish to say.

MR. CABECA: Thank you.

MS. MYERS: Britten Sessions from Lincoln Law School of San Jose, associate dean of intellectual property and director and founder of an intellectual property clinic.

MR. SESSIONS: Thank you very much for the opportunity to testify today in relation to the SUCCESS Act. Director Iancu indicated in, I believe about one year ago, that our patent system is at a crossroads, and I agree very much with this statement.
This is a question, I think, hypothetically we could pose ourselves as a nation, as a patent market, continue our legacy of building upon fundamental patent rights or, on the other hand, will we potentially remove such rights for Patent Owners? The SUCCESS Act fits squarely into this focus of ensuring that we are continuing to build upon such patent rights by evaluating whether individuals and entities, with a particular emphasis on women, veterans, and minorities -- have effective access to the patent system. This emphasis, effective access to the patent system, is also in alignment with many other USPTO initiatives, including the pro bono patent program, as well as the law school clinic certification program.

Both programs were introduced roughly in the 2008 time frame. Both take a distinct and different approach to answering the essential question how can they do as PTO says with providing greater resources to those who would otherwise be financially estopped from receiving such services.

The pro bono patent program is a nationwide network of independently operated academic and non-profit organizations. The endeavor to match volunteer patent practitioners with financially underresourced inventors seeking patent protection.

Additionally, my clinic, which is part of the law school
of clinic certification program, train students who, in turn,
provide the patent services under the guidance, mentoring, and
ultimately approval of a licensed practitioner to those in our
community for free. The legal services have no legal cost.

It is a literal win-win situation where the students can
get experience while they are students, and the community benefits
from having high-quality patent services without any legal
expense. Over the years, it has been my experience of what the
SUCCESS Act is presently evaluating coincides with the types of
two-fold and entities -- namely, women, minorities, and
veterans -- that come to such USPTO-approved clinics. It is
precisely, therefore, at this perspective; namely, my dealings and
representations of and interactions with these types of inventors
that I feel compelled to speak on behalf of today.

I have segmented my remarks into two main categories.
First, indications of success, and two, actual feedback from
inventors, including potential avenues for further development.
First, with respect to indications of success, the initiatives put
forth by the USPTO, I believe, are assisting with improving
effective access to the patent system. For example, with respect
to the pro bono program, during the first three-quarters of fiscal
year 2018, the program actually assisted underresourced inventors
and small businesses with filing 205 patent applications and 2
actually fielded 1,757 public inquiries and matched 432 3
underresourced inventors with qualified patent practitioners.
4  Additionally, with respect to the clinic program, over 5
875 patent applications have been filed since the beginning of the 6
program, and for fiscal years 2017 and '18, there were over 4,100 7
clients engaged by clinics in the program. Therefore, clearly, 8
the numbers alone speak for themselves. These initiatives are 9
providing services to those who would generally not otherwise 10
receive these types of services.
11  In short, when I look over the impact that my level of 12
clinic alone has provided, I'm not only encouraged by the number 13
of results alone but also by the ways in which these inventors 14
have literally been granted effective access to the patent system. 15
Suffice it to say that the many thank-you notes my clinic has 16
received all indicate a similar theme. First, an immense 17
appreciation for the services we have provided, and secondly, 18
relief that they finally found a financially viable channel to the 19
patent system.
20  All of this, in my mind, shows the success of these 21
initiatives in that women, veterans, and minorities are being 22
granted more effective access to the patent system than before.
However, the universal adage that all things can be improved, I believe, applies to even our currently improving patent system as well, which leads me to my second category and that is actual feedback from inventors and avenues for development. 

Rather than solely speak for inventors, I wanted to give many of these inventors a chance to speak for themselves, and to that end, at a recent inventor conference, I interviewed them, including some of my own clients from the clinic, asking them what issues they are facing in today's patent market. Their frank responses have concluded, professed on the best instruction on the issue these inventors face in today's patent market. I have organized their lengthy input all leading to a few categories followed by my recommendations on how to potentially resolve these issues.

Category No. 1: My patents can easily die. And this is a thing that we have heard from even a number of people today.

Quote 1, "There is a risk in working with a large company. If one goes and presents intellectual property to them, the company may look at it in a different way. For example, they may consider simply going ahead and infringing the rights and then appealing it to the PTAB, which has a high chance of invalidating the patent."

Second quote: "Due to how easy patent invalidation has
PUBLIC HEARING ON THE SUCCESS ACT

become, companies do not feel a need to license. Instead of licensing it and being more economical to infringe and invalidate the patent."

It is startling to me to receive repeated feedback from many inventors that companies blatantly will disregard patent rights because, quote, "It is cheaper to kill a patent than it is to license one."

If Patent Owners cannot rely on a granted patent protection as a basis for a protection and if the risk for invalidation is high, then this causes the inventors to wonder why they went through the time and expense to even get a patent in the first place, which leads me to my first recommendation, which is to provide greater stability for 101. Again, it's a recurrent theme here today.

The past seven years, I think, at a minimum, has taught us that many are a bit confused on how to deal with or even rule on 101 issues in patents. The Supreme Court in the Alice decision left open much of the implementation of 101 construction to the courts, which subsequently created a fragmented landscape with often conflicting opinions.

The USPTO has repeatedly recognized this issue and sought to provide greater consistency of analysis relating to 101
by issuing several guidelines. They even appointed individuals to
eliminate inconsistencies in the interpretation and implementation
of the Alice test among different branches of the USPTO. This is
very much a monumental task and one that, in my opinion, deserves
some of our greatest attention. I applaud the USPTO for their
tries to rectify this issue. However, USPTO guidance and
policies do not extend to other courts nor are the USPTO's recent
guidelines a permanent fix. For example, the next director may
modify the burn (ph) guidelines.

Thus, in order to effect a lasting change and not just
at the USPTO level but nationwide, in each PTAB hearing and
federal court, Congress needs to come together to more fully
implement rules that bring stability to a very volatile subject.
I acknowledge that Congress currently has a number of proposals,
and even in both the House and the Senate, relating to patent
reform. Narrowly, all of these proposals includes some provisions
relating to subject matter eligibility. At a minimum, we need to
know everything so that Congress recognizes the importance of
stability for patent subject matter eligibility and implements
policies that allow courts to act in a consistent manner.

Category No. 2: "I can't find financial backing to
assert my rights." First quote, "If you do not have millions of
dollars at your disposal, you will need a contingency attorney or investors, both of which are now in short supply. Without these resources, patent holders are defenseless and incapable of licensing."

Second quote: "The effects of the PTAB analysis decision made me unable to defend my patent rights and caused my investors to leave." The risk of the patent market has caused contingency arrangements, which was the primary manner in which inventors historically had effective access to the courts, to vanish. Litigation is expensive, and without a financial way to represent these smaller entity inventors, including women, veterans, and minorities, they are effectively prevented from being able to assert their rights.

Further, the increased risk has caused inventors to close their pockets, which leads me to my recommendation No. 2: Reduce the risk. Now, to simply indicate to reduce the risk is an easy conclusion to say but rather hard to implement. For example, one of the main goals of them are the America Invents Act and subsequent court direction for them was to eliminate trolls and bad patents. I believe all in the patent marketplace would agree that assertions without merit and bad patents should be removed.

However, as Director Iancu recently indicated, "In our
zeal to eliminate trolls and the bad patents, we have
overcorrected and risked throwing out the baby with the bath
water."

Bringing balance to our system must include some way for
Patent Owners to have a financially viable option to assert their
rights, both with respect to contingency options and funders. I
agree with Director Iancu, who indicated, "Let's work together to
find narrowly tailored measures to eliminate only the faults in
the system while promoting the vast amounts of amazing innovation
America is capable of."

So what narrow measures can we consider? I have a few
here. First, we can support Congress in bringing greater clarity
to subject matter eligibility, as I have indicated. We can grant
the USPTO greater autonomy of the money it collects. We can
restore injunctive relief. Patent rights allow for a right to
exclude, and yet, under the current standards set forth by eBay,
the right to exclude is greatly restricted.

We can minimize multiple proceedings or serial filings
to dispute the validity of a patent. Large corporations can
weather -- can finance multiple proceedings; inventors, including
women, veterans, minorities, often simply cannot. We can deter
efficient infringers, which is a new term here in Silicon Valley,
which actually, I think, came from New York, which may those who
prefer to purposely infringe a patent and dispute its validity
rather than to have a license by enforcing -- and we can deter
this by enforcing willful infringement provisions or, as some have
even hypothesized, levy criminal sanctions similar to other forms
of IP, particularly in relation to trademark and copyright
penalties.

We can assure that PTAB judges are properly appointed
per the appointments clause of the Constitution and that they
comply with the judicial rules or codes of conduct consistent with
other federal court judges to rule on patent-related issues.

Category 3: Should I simply pursue protection outside
of the U.S.? Quote, "I am considering no longer patenting in the
U.S. I can get better protection in China. As a veteran, I do
not want to move my creations elsewhere but feel that, in view of
the current market conditions, I do not have any choice."

Inventors feel that foreign jurisdictions currently
offer more stability for asserting patent rights than what the
U.S. provides. This is also consistent with the fact that
investors generally are pushing dollars to other jurisdictions to
pursue Patent Owner protection and assertions, which leads me to
my last recommendation and that is, let us learn from history.
The Diamond versus Chakrabarty case, for example, allow for a living subject matter to be patent eligible. As a direct result, the U.S. became woefully dominant in the biotech industry for more than a generation. Currently, the U.S. has fallen behind on many other up-and-coming industries. For example, China is leading with respect to artificial intelligence investment. Investors follow the money, innovation follows the investors, and economic growth follows the innovation. As such, having a census in place consistent with the measures I have previously indicated will ensure that the U.S. remains on the forefront of economic growth, innovation, and investment.

Now, to conclude, we, indeed, do stand at crossroads. I stand with Director Iancu again who stated, "Born of the Constitution as steeped in our glorious history, the American patent system is a crown jewel: A gold standard." Let's take action now to ensure that inventors -- and particularly women, veterans, and minorities -- have not only effective access getting the patent but also effective access to the courts in enforcing their rights as well. Thank you.

MR. CABECA: Okay. Next -- thank you. Next, I'd like to call up to the podium Professor Robin Feldman, who is at the University of California Hastings College of the Law.
PROFESSOR FELDMAN: Director Cabecia, Director Clowes, Deputy Myers, and other distinguished members of the USPTO, I'm honored to be here today to address an important issue: Maximizing our nation's innovative potential by turning our attention to women founders and inventors.

I'm Robin Feldman, the Arthur J. Goldberg distinguished processor of law and director of the Center for Innovation at the University of California, Hastings Law. At the Center for Innovation, I'm privileged to lead 12 team members who engage in research on issues related to science and technology. We also engage in programming that provides on-the-ground support for innovators, our flagship program, the Start-up Legal Garage, provides free legal services to roughly 50 early-stage technology and life science companies every year, and our focus is on women and minorities.

The work is supervised entirely for free by outside lawyers, and I do mean entirely for free. We do not allow deferred compensation or any other payment mechanism. It's a system that we've guarded fiercely for a very long time.

In addition to Start-up Legal Garage, the center has now launched Lex Lab, which includes an accelerator for legal tech start-ups. In short, our team at the Center for Innovation has
the opportunity to see entrepreneurship both from an academic research perspective and on the ground.

So, today, I would like to talk to you about both the successes and the challenges for women in technology, invention, and entrepreneurship. In recent years, women's involvement in entrepreneurial activities has sky-rocketed, providing a significant increase in opportunities for female leaders. Women entrepreneurs not only diversify the innovation space, they also generate new ideas, inventions, businesses that would not have existed otherwise. So between 2017 and 2018 alone, women created more than 1500 net new businesses every day. Over the past decade, the number of women-owned firms increased by 58 percent, far outpacing the national percentage growth of 12 percent. And furthermore, recent studies have even found that women-founded businesses bring in more revenue, are more innovative, and are more sustainable than those without women.

Research suggests, however, that women inventors and their potential remains highly underutilized. For example, even though women are catalyzing growth in entrepreneurial sectors, they're still underrepresented and underfunded in the start-up and tech industries. Every year, from 2012 to 2017, only 17 percent of inventor-backed start-ups were women founded, stagnating over
the last five-year period. In other words, we're not moving forward. We're staying right where we were.

So consider technology leaders such as Google, Facebook, despite considerable efforts to increase diversity at Google, women still make up less than a third of its employees and only about a quarter of its leaders. Moreover, the roles that women play in technology companies may leave them more on the periphery and less in positions perceived as being at the core of the company's power, and that is a problem.

At Facebook, in 2018, for example, women occupied just 22 percent of technical roles and 30 percent of the senior leadership roles. And across several major tech companies, women occupy similarly low percentages of technology in leadership positions, often facing discrimination along the way.

Now, the patent system can be central for changing this landscape. In our spectacular and valued patent system, the power of invention and inventorship confers strength both in terms of signally technological jobs and in terms of conveying bargaining power.

Ensure that women have access to those avenues of strength is an important part of securing the science and technology pathway for women, along with the economic benefits for
society for all of us as a whole, and thus, it is critical that
women gain exposure and access to the patent system and that we
eliminate barriers along the way.

In the entrepreneurial space, I have to say the numbers
are not encouraging. Women continue to struggle to obtain funding
for their businesses, particularly in the start-up environment.
Last year, female-founded start-ups received $1.9 billion in
venture capital. That was wonderful to see, but that funding is
out of a total of 85 billion overall, a mere 2.2 percent of all VC
dollars. In contrast, all-male teams secure roughly 79 percent of
the VC dollars.

And a study by the National Women's Business Council
found that, among the founders of the most successful companies,
women were able to launch their start-ups using -- I'm sorry, men
were able to their start-ups using six times as much capital as
women. That's a tough place to start from.

And, in 2017, women accounted for only 8 percent of the
investing partners in the top 100 venture firms. These early
struggles in funding discrepancies pulls long-term challenges for
the economic stability of female founders and their ventures, and
we know from research that the ability to have patents plays an
important role in this process.
Consequently, any legislative policy that seeks to remedy these inequities must be crafted with a thorough understanding of women founders and business leaders, their funding and revenue streams, and quite frankly, their networks. As the USPTO profile of limited ventures progress and potential notes, women accounted for only 12 percent of all inventors who secured patents in 2016.

Questions surrounding women in inventorship per se are understudied. Nevertheless, there are tantalizing hints of leakage in the pipeline; that is, ways in which women we would expect to see in the invention space seem to be left out or left behind, and that is where I believe we have the most potential to make a difference.

On the simplest level, how can women inventors build and lead teams to support their innovations if they are faced with significant challenges in securing patents for those inventions in the first place? And beyond that, if we want women to have the opportunity to climb the soaring heights of Silicon Valley where we now sit, the foundation must be strong, and the patent system is key to that foundation.

Now, the SUCCESS Act acknowledges the extraordinary potential of women inventors and the processes it has set in
motion, hopefully, will be instrumental in encouraging women to apply for patents and in fostering their entrepreneurial growth. In particular, what I find so hopeful about the SUCCESS Act is that it provides an opportunity not only to highlight key factors that help women entrepreneurs succeed; it also allows us to shine light on the roadblocks that currently hinder their creative efforts.

I want to take a moment to be completely candid with you-all. I have been troubled of late by what I perceive as fatigue on the topic of women, technology, and entrepreneurship. The sense I get is something like the following: We all know there's a problem, it's not clear anything will make a difference, why should we keep looking at this? We have heard it before. As an academic, I continue to believe that we haven't found a solution. Perhaps we don't understand the problem fully as we think we do, and perhaps we haven't looked in the right places.

So let me share with you a study we are attempting to undertake along these lines. The University of California Hastings Center for Innovation has access to a dataset of more than 750 start-ups. The dataset consists of start-ups founded by those who are university affiliates, including graduate students,
post docs, faculty, and others who have licensed technologies from their home campuses. We are fortunate that it is a wonderfully robust dataset with information, including industry, revenue, venture funding status, numerous other characteristics. It also has the advantages of coming from campuses that vary in size, resource levels, and location, and we have already sorted for gender information.

Now, universities are a particularly important part of the innovation pipeline because it's there that future science and technology innovators find their training, develop mentorship, and more importantly, begin to create the networks that will support them down the road and that we are beginning to understand are so critical. Our hope is to use this extraordinary dataset not just to look at where women are not adequately represented along the way but to see what has worked for women so that we can try to expand and replicate.

And although we can learn much from mining the data itself, we also hope to look in depth at the experiences of the women and the sample, including their experiences with patenting and in invention. My own experience in looking for support for this endeavor reflects what I described before as fatigue on the topic of women in technology and entrepreneurship. And I will
tell you that, having been privileged to receive tremendously
generous support for projects in a wide range of areas, from
privacy to patent licensing to healthcare innovation, it is
striking to me that, while Silicon Valley speaks about issues
related to women in technology and entrepreneurship, it can be
remarkably challenging to inspire their support.

I am hopeful that the SUCCESS Act will help reenergize
this area, encouraging Silicon Valley to keep looking and keep
striving for answers and solutions. Thank you very much for
allowing me to speak today.

MS. MYERS: Thank you. Now, I'd like to call Hattie
Carwell up to the podium. Ms. Carwell is from the Coalition of
Hispanic Advocate and Native Americans for the Next Generation of
Scientists and Engineers, CHANGES.

MS. CARWELL: Good morning, everyone. My name is Hattie
Carwell, and I am here to provide testimony that identifies a
social economic benefit of the SUCCESS Act and to provide concrete
ideas to increase the participation of women, the veterans, and
minorities in particular in applying and receipt of patents.

Thank you for this opportunity to testify.

I heard about this event just a few days ago, and
basically, as a result of the dedicated USPTO employee colleague.
I am president and co-founder of the Coalition of Hispanic, African, and Native Americans for the Next Generation of Engineers and Scientists, CHANGES. Also, I am the executive director of the Museum of African-American Technology, MAAT Science Village in Oakland. I am a health physicist by professional training and have worked nationally and internationally for the U.S. Department of Energy and the International Atomic Energy Commission. In 2010 to 2011, I served as president of a National Technical Association founded in 1926.

The vision of CHANGES is to bring to bear the collective influence of Hispanics, African, and American Indians in STEM and architecture, to broaden participation of minorities in STEM and also architecture, especially by encouraging students in technical excellence, fostering workforce development and inclusion, and developing policies and programs that promote workforce diversity in science and engineering.

CHANGES is a coalition of 15 minority technical, professional organizations, and its goals are twofold: To elevate the national visibility and influence of the member organizations in the development of STEM research policy and educational programs; two, to strengthen our member organization's programs and finances in support of the next generation of engineers and
scientists and architects.

The mission of MAAT Science Village, which I also founded, is to make available to the public information about the technical contributions of African-American engineers and scientists. The museum endeavors to make the public aware of the African-American ingenuity and its impact on the economic development of the United States. It conducts minority youth programs to encourage them to prepare for careers in the STEM workforce.

Both CHANGES and MAAT Science Village are not strangers to the USPTO. For ten years, I served on the selection committee, which decides on the induction of inventors into the Inventors Hall of Fame. The USPTO in Alexandria, Virginia, is a major sponsor of this program and houses its Hall of Fame museum. I have nominated minority candidates to receive the presidential national medal of technology of innovation -- and innovation awards. CHANGES has utilized the USPTO meeting space. Also, the USPTO space was used to celebrate the National Technical Association's 90th anniversary where its member inventors were acknowledged and celebrated.

The purpose of my testimony is to express the urgency that the Federal Government needs to respond to, its
responsibility to work with the private sector to close the gaps between a number of patents applied for and obtained by minorities, women, and veterans compared with the rest of patents obtained in the nation.

This is necessary in order to harness is maximum innovation potential of all and to continue to promote the United States leadership in the global economy. Currently, the human capital of women, veterans, and in particular, minorities, is underdeveloped or undeveloped. The U.S. cannot afford to waste technical talent because it threatens our national economic security. It must include organizations like CHANGES to accomplish the goals of the SUCCESS Act.

The inventors of the SUCCESS Act fail -- fails -- I'm sorry -- the objectives of the SUCCESS Act falls within the purview of the organization that are represented in CHANGES. The significance, our involvement, is often overlooked and not solicited until all the planning has been completed. We often find ourselves reacting to and retrofitting ineffective solutions that could have been avoided if we had been at the table in the beginning.

Because only a few days were allotted to prepare my comments, I have chosen not to address all of the issues provided
in the Federal Registry. The issues that I will address are
sources available to identify minority inventors to the impact of
education and professional circumstances and socioeconomic factors
that facilitate or hinder the ability of women, minorities, and
veterans to apply for and obtain patents or to pursue
entrepreneurial activities, the social and private benefits that
result from increasing the number of patents applied for and
obtained for the same target group as well as businesses owned by
these groups.

I will provide insights on the impact of educational,
professional circumstances as well. In addition, I will identify
some institutions and entities that should play an active role in
promoting the participation of minorities in particular.

Further, my testimony will identify some public policies
funding needs to programs that the Federal Government should
develop and implement -- should promote the participation of the
targeted groups, data available on minorities of interest. The
vast majority of information available about minority inventors is
spread out in biographies, are listed in tables found in books,
presentations, or internet sites. The information has been
primarily generated by minorities themselves.

The one historical study commissioned by the USPTO to
determine the number of African-American patentees was researched and published by Henry Baker, an African-American patent examiner, in 1913. It is the only formal study that has been conducted to this date. It is only of late that others, other than minorities themselves, have been interested enough to determine the contributions of African-Americans and their attainment of patents.

There is a diverse number of publications which can be utilized to identify minority inventors, but the information is dispersed among many documents and few contain numerical data like the 1913 study. Such sources require follow up with patent numbers and verification to establish their credibility. Also, the data from the various sources must be consolidated.

Some inventors, however, may have more than 100 patents. For example, Dr. Marian Grove (ph) has over 200 patents, with others pending. She's a great candidate for the induction into the National Inventors Hall of Fame. It is not clear whether the intent of the study is to determine the number of inventors versus the number of inventions. Probably both types of data are needed to make a complete study.

The publication frequencies vary and all issues may not always include information on inventions. Information may only
appear as a featured story. Some publications have been
discontinued. Examples of such publications are the U.S. Black
Engineer magazine, of which is quarterly; the National Technical
Association Journal, which is an annual publication. The National
Society of Black Engineers Golden Torch Award is an example of an
award program that's held annually. The National Organization for
Professional Advanced of Black Engineers, (indiscernible),
conducts an annual conference and awards program, to name just a
few.

Many minority inventors are members of the 40-plus
minority technical societies, and among -- and information about
their inventions is attained through regular meetings and annual
conferences. Newsletters, hard copy, and electronic are also
among the types of publications that include data on
African-American engineers.

Also, there is some information that can be gleaned from
historically black colleges and universities who record patents
obtained from research and development. HTC used especially those
who have signed entrepreneurship and innovation programs where
graduates on inventions resulting from their research.

The White House initiative on historically black
colleges and university programs should be helpful in attaining
the names of the HTC youths that have innovation programs. A 2017 review of 11 HTC youths, which are the Carnegie (ph) classified as R-2 or Class 2 research holders --

MR. CABECA: And that's time, so we can just take a minute to wrap up your comments. Thank you.

MS. CARWELL: I will.

Also, let me just skip down to suggestions for generating the missing data. I consulted a computer scientist who simply verified that you can compare the USPTO database with the census data that's sorted by gender and race and ethnicity. And within a week, you can construct a database identifying minorities and women. The data will be nine years old, but if it's thought to be useful, suggestions to the 2020 census may also be helpful to include questions that provide the data.

The impact of education professional circumstances and also the access to funding, many minorities of first generation college graduates and resources are scarce, to say the least, when they come -- graduate with monumental debt -- college debt. They do not have a nest egg or access to discretionary funding to pursue -- to pursue patents. Assistance is sorely needed. Even other than women have this -- share this same problem.

MR. CABECA: Thank you.
MS. CARWELL: Can I skip to my recommendations?

MR. CABECA: Thank you. If you can just take one minute left.

MS. CARWELL: CHANGES recommends the following: Support for CHANGES, minority, technical organizations, minority serving institutions should be increased so they can join in the work with the federal government as full partners to help motivate and nurture the target population.

Diversifications of positions that fall out from the SUCCESS Act should be stipulated to definitely be diverse. Recommendations that accommodate cultural differences, educational, and economic differences should definitely be a part of the recommendations. Congress should definitely provide adequate funding to achieve the goals of the SUCCESS Act.

Also, the patent process is sometimes daunting, depending on the level of education of those who are curious enough or passionate enough to make a difference in bringing their ideas to fruition.

MR. CABECA: Thank you. Your testimony can be -- your written testimony can be made part of the record for our report, and thank you very much for providing your testimony. I appreciate it.
In the interest of time and keeping us on track for the afternoon program, we're going to take this opportunity now to break for lunch. So, again, lunch is on your own. So there's a variety of different places nearby. And we'll reconvene here just prior to one o'clock to get started, one o'clock sharp.

So if you'd like to grab your lunch and bring it back, as I alluded to earlier, there is a conference room on the opposite side of this floor where you can sit at a table. There's also tables here in the lobby, and we welcome informal discussions with the USPTO and SBA team and all of our presenters and participants here today. So thank you. That concludes the morning session, and we'll reconvene again at one o'clock or just before. Thank you.

(A lunch recess was taken.)

MR. CABECA: Okay. Good afternoon, everyone. This is -- for those on the line, this is John Cabeca, welcoming everyone back to the afternoon session and public testimony for the SUCCESS Act hearings. I'd like to go ahead and get started and introduce our first speaker, Tina Door, who is counsel at Cantor Colburn law firm and also the secretary for the Women in Intellectual Property Committee at the Intellectual Property Owners Association. Tina?
MS. DOOR: Thank you very much. First of all, I want to thank the USPTO for this opportunity to speak today, and I'm honored to be able to contribute to not on an important discussion but a discussion that is near and dear to me as a scientist, as an IP practitioner, and as a diverse woman, as my mother is an immigrant from South Korea and my father is a U.S. Navy veteran.

Everyone's done a great job of setting the stage, talking about the narrative reports, so I won't talk about any of those statistics, but I do want to mention that the institute for women's policy research has predicted that, without the concerted effort to change the course, it will take until nearly the end of the century to reach (indiscernible) in innovation, and that is something that is hard to stomach.

Like many organizations, IPO was alarmed by this data, and they wanted to devote real time and resources to address -- to raising awareness of the issue and also to provide tools for companies or organizations to address the issue.

And so there are real reasons to be concerned, and this is on both sides of the fence, from the inventor's perspective and then also from the corporation's perspective. Concern from an inventor's perspective stems from the fact that, in many technical fields, a patent filing is related in some way to salary increases.
and promotions within the organizations. So that means potentially a disparity in salary or level within an organization could be related in some way to patent filing.

And, then, on the other side of the fence, concern from the organization's point of view stems from the fact that, when innovation is left unpatented, economic value is left on the table. And, of course, corporations, organizations all want all of their employees living up to their full potential and contributing their highest value.

So IPO has various committees. I'm a member and secretary for the Women IP committee, and we have a subcommittee called the Women Inventor Subcommittee, and Sandra Nowack, who many of you know, and Michelle Dugby, have done -- have spearheaded a lot of this work, and the subcommittee has looked at this issue. And there are two goals of this subcommittee: One, to raise awareness of the issue, and the second goal is to offer specific tools that corporations and organizations can use to specifically address those issues.

Now, to deliver those goals, the subcommittee has spent the last year or so doing a couple of things: One, public speaking on this topic as much as possible at events like today, at CLEs, but also speaking directly with organizations and
corporations about the issue.

The second thing that I'll touch on today is a toolkit's been developed, and this toolkit will be available. The goal is to launch in September, around the time of the annual meeting. It will be available on the IPO's website, and importantly, in this -- this just demonstrating how important this issue is to IPO, it will be available to not only IPO member organizations but it will be available to all corporations, anyone who wants to access the toolkit.

The toolkit briefly -- and I'll talk about in its current state -- includes four general steps, but it allows organizations and corporations to assess their current state of awareness. It provides the tools to dive deep into the root causes of their issues that they might have, and it provides tools for implementing, monitoring, and assessing the success of those short-term and long-term programs.

Importantly, the toolkit includes four steps, and these steps are intended to be circular rather than linear, so it's a continuous process of these four steps. The first step is to raise awareness -- and I'll talk about each of these a little more -- to raise awareness, the second is to discover root causes, the third is to develop a short-term and long-term program
targeted to those root causes, and the fourth is to launch and
monitor the programs.

Now, going back to the first step: Raising awareness.

We're all very aware of the issue in this room because we're sort
of it in, but I am still surprised at how people may not be as
aware as we are. So that's an important part of the toolkit, and
this part of the toolkit includes things like a short elevator
speech. It took five minutes. Sometimes that's all you have to
present your case. And it includes sample slides for executives
in leadership. It includes tools for how to get the data to see
where your organization currently stands to gather that data,
because that's what you need to move forward.

The second step after raising awareness is discovering
root causes. And it's no surprise that, when organizations and
corporations spend time up front understanding the causes for
their particular group, that they are more effective at
implementing long-term sustainable change. Examples of different
root causes include difference in confidence gaps, differences in
accessibility and knowledge of patent filing.

The third step is to -- once you understand those root
causes, to develop short-term and long-term programs, and, again,
this section is organized by root cause, and it will include
examples of programs that other organizations and corporations have previously found to be effective at addressing those particular root causes.

The last step is launching a monitoring of those programs, and this section includes ideas for successful launch as well as metrics and monitoring activities for assessing the progress and success of those programs because there's no point of continuing with a program if it's not being successful, so this is important, to continuously monitor the progress.

Lastly, this section includes tips for when to go back to step two, because I mentioned before that it's important that these steps are repeated in the cycle. And so, sometimes, you need to -- if something is not working, you need to go back and maybe raise awareness to upper-level management, if there's a change in leadership that you need to address, or maybe there's a new root cause that you need to dive into and further understand.

So that's the toolkit in a nutshell. Another important point about the toolkit is that it's never intended to be finished. Instead, it's intended to be a living document that stores and houses information that's continuously updated, and that's based on feedback from others who are using the toolkit.

And to that end, we are currently working with many
organizations, 425 currently. We're always looking to add more, including Proctor & Gamble, who ranked No. 1 on the PTO's report, Dell, Bristol-Myers Squibb, 3M, and of course we're looking into organizations like the PTO, (indiscernible), and all them.

So, again, a lot of the value comes from input from organizations and corporations who use the toolkit and use it and provide feedback for revisions. So with these concerted efforts to, one, raise awareness and tools that organizations and corporations can use to improve their diversity, we hope that we can move that needle significantly further away from that predicted antonym by the end of the century to reach gender parity in innovation. Thank you very much.

MR. CABECA: Thank you, Tina.

I'd now like to call up Liji Gopalakrishnan to -- from Rambus to come and provide her testimony on behalf of Rambus.

Thank you.

MS. GOPALAKRISHNAN: Good afternoon, everyone. I am Liji Gopalakrishnan, director of memory architecture research Rambus Labs. I have been working in the semiconductor industry for over 20 years now, out of which around 14 years have been at Rambus in various roles.

The thing is that since I'm working in this field and --
I mean, I heard inputs from different members of the society here. It was very interesting, and as any inventor, I have about 13 issued patents and a few pending ones and many technical publications and conferences. I thought it was important for me also to come here and share some thoughts on how to improve participation among women, because it is a real problem, and that I can see every day.

Okay. I think, just on the personal side, just to share a little bit about myself, I'm a family person. I have a teenage daughter who is a freshman at college now. And I came to this great country when my daughter was just a baby and went through all the struggles of an immigrant: Adapting to the new culture, trying to raise my kid, find a job, and I mean, try to -- doing my master's in electrical engineering, all while working and raising -- I mean, supporting my family. That's all really hard.

If you don't have mentors or a support structure around you, it's not at all easy, and that's why I can identify with the struggles of many women out there, I mean, really having gone through this process.

And that is one of the reasons why I have been kind of volunteering in many STEM-related activities. I really liked Stephanie's speech, and that was -- I mean, similar things is what
I think we need to encourage women to participate. For many years ago, almost eight years now, I have been leading and at workshops, organized by expanding new horizons and organizations and also volunteering as a judge at Silicon Valley science fair.

I was looking at the list of suggested topics for speakers at this hearing, and one which then I saw was on the social and private benefits of increased patent applications for minorities, women, and veterans. I thought that's an important question but, in my mind, to answer that question, I think we should first consider or examine why innovation is important in general. Okay. That's one part of it, like having a patent benefits the mentor person, for instance, and the other bigger question of how women benefits the society or more as a whole.

And I'm just going to focus on the second part in this case.

I think from the age-old days when prehistoric man invented the wheels and hunting weapons and everything like -- the survival human -- humankind has survived and flourished, and I believe not because of their muscle power but because of their brain power. So that supports the main point here.

I mean, all the data that I'm going through the industry of revolution and the rise of the semiconductors where I work and internet and space technology, just to name a few. Right? All
fields like medicine, agriculture, transportation, communication, sports, entertainment, everything has benefitted from all this brain power and ideas and innovations and developments that have happened over the ages.

I think it's only natural, we want to continue this human race to advance. It's not just an individual, personal problem or this one country's problem. Just for the human kindness, it's important for us to increase this innovation process.

Okay. Now, that we have just talked about the general importance of innovation, I think the next question, of course, is about how to -- and creating more of it. And there are many ways, but one of the very simple, straightforward answers: To get more people involved. And that is where, when I look at the statistics, and I think (indiscernible) was discussed, that 50.8 percent of the population -- U.S. population and (indiscernible) of women, how come only 12 percent of them are contributing to practice of innovation? That's a huge opportunity there. And when we add minorities and veterans and other such groups, then the number goes up even more.

The ideas like -- the goal is to get all of these different segments of population to contribute, to solving the
problems that we all face all over the world, I would say, and kind of bring in the diverse perspectives and increase the quality of the solutions and inventions they bring to the table. So I think that that's working, in my mind, is very important.

And now when we -- when we talk about bringing the equality of (indiscernible) to the field, then they gain -- sometimes I've heard questions from people: Why do we say that some special groups need more help and why do they get a special -- we do we talk about them more (indiscernible)? I mean, that's right, but again, I can't speak for all these sections but at least for women, I think there are multiple reasons why they need a little more help. Number one, one thing is they face some unique challenges, like childcare obligations, household responsibilities, a lot of things.

I still remember the anxiety I used to feel when I was taking evening classes for my master's course with my seven-year-old waiting outside the classroom for her mom to finish up. I used to send her to daycare in the mornings and other things so, when there's no school, it was fine, but I could not find childcare in the evening on nights. People have their own life. There was nobody to kind of support or help me out at that time. So either you give up your dream or you can go through some
extreme situations like this. I'm lucky I have a very
understanding and nice little sweet little daughter. But now we
are through all that. But I can imagine it's not just me. There
are other people out there going through probably much worse than
that.

Okay. The second one is the lack of information on
exclusion (ph). Even, like I said, I came to know about these
things much later, and a lot of girls, they don't get heard to
hear about the patent process or the opportunities and what it
takes to achieve that goal.

And then the other challenge, I think is for those
especially is many of these topics don't often come into their
discussions. Like regular discussions are not about these kind of
things, and this carries on into adulthood. When a bunch of men
get together and talk, it's about seven kinds of topics very
often, and girls don't get to hear about that. They don't get
that same kind of opportunity.

And number three is (indiscernible) of society. Coming
to this last week, I was listening to (indiscernible) by Rachel
Oshawa. She's the (indiscernible) at Intel. And I thought her
story was very funny, so I thought I would share it here. She was
talking about when she attended a big Wall Street board meeting,
she walked into the room -- (indiscernible) somebody here -- she walked into a big Wall Street board meeting and sat down on a chair, and the gentleman sitting next to her stood to get him a cup of coffee. Of course the woman, at such a meeting, she must be an admin. What else can she be? So she was very gracious about it in the way she handled it, but the thing is, see, we have a long way to go before society starts seeing men and women as equal in all fields. And that is the experience of somebody at that level, you can just imagine normal, everyday women.

Okay. Now, going forward, it's the lack of normalness.

This is another challenge, especially with such a low rate of mentorship among women. The young girls, they don't get to learn from inventors and see live examples of how this innovation process happens, and that play be a big deal. I mean, it's a big thing to be able to see this.

Even in my case, I work in a company which is -- I mean, it was founded by Stanford professor Mark Horowitz and my (indiscernible) to commercialize that foundation and inventions, and the whole company is rooted in innovation and patent licensing and things like that. Even for me, it was very hard to get started. I mean, for example, just to give you an idea about the process. You first have to come up with a good idea, which is
(indiscernible). We are usually self-critical and we are
(indiscernible). And then, after that, you submit your idea.
Then you have to present it in front of a bigger approval
committee, which, as you may guess, consists all of men, and
(indiscernible) and then you have to defend it. They all ask so
many questions and it's not easy. It can be really intimidating
in how you really you want to go out of your comfort zone and do
all these things. So it's not easy for -- not only easy for many
men, let alone, you know, many women. It's other people -- it can
be really tough.

So now, recently, as the only female working member of
that committee, it's been a tremendous help. I get to see not
only and share of my ideas and things, also about other peoples,
what they're doing and how they go about this. It helps. And
then you get more ideas, hearing about other people and what
they're doing and to get -- I mean, that's how it kind of -- it's
a cross-pollination, and it's a positive feedback.

So, finally, when we think about how to increase
participation on all these sections, what I think is possibly
(indiscernible) on these properties that I just listed. And only
then we can kind of make a dent here. And it's all about training
and giving the women (indiscernible) the necessary tools,
spreading awareness. And if USPTO could do something like what
Stephanie's group was doing, like provide volunteer blank forms
where women or minority inventors can come and kind of inspire and
mentor (indiscernible), that will go a long way. And especially
like, with my STEM activities, I feel that whatever there are
hands-on activities, rather than just talking or lecturing, like,
kids really get excited. They get to see, okay -- I mean, kids
are -- no, not kids. Young women, like whoever -- I mean, is
qualified, we should encourage all of these sections to
participate and to see the thing for real and kind of having
somebody there who has gone through this process to help them. I
think that can make a real difference.

And then -- and I'm hearing about all the legal clinics,
pro bono clinics. That's really good work that these groups are
doing. Thank you.

And then collecting the demographic info (indiscernible)
question, I think that's a great idea. It will help us measure
progress and treat the programs, right, because we want to ensure
the success. I don't think there is any one silver bullet that
can solve all this, so it will be to have a collection of efforts
by different groups, including the PTO. And it's important to
keep (indiscernible) how -- whether we are making a dent or is
there something we need to change so that we can figure it out.
And, automatically, in my mind, it's about our -- about
equal opportunity and contribution from all sections of the
society towards the progress of mankind, this nation, this world.
And I wish USPTO all success with the implementation of the
SUCCESS Act. Thank you.

MR. CABECA: Thank you, Liji.
Okay. Next, I'd like to ask Charu Kurani from Facebook.

MS. KURANI: Thank you for your time today. I'm honored
to attend the third public hearing of the Study of
Underrepresented Classes Chasing Engineering and Science Act
signed into law on October 31st, 2018. My name is Charu S.
Kurani, and I'm a patent attorney on the legal team at Facebook,
and I'm speaking here today on behalf of Facebook.

Diversity and inclusion are very important values at
Facebook, and we're committed to taking action that focuses on
identifying and improving the underrepresentation of people in the
patent system. This issue is also very important to me
personally. As a mother to a young daughter, I want to do
everything that I can to change what the future looks like for
her. If she chooses to go into tech one day, I want to see -- I
want her to be able to see other women innovating and
participating in the patent system at the same rate as their male counterparts. I want to her feel like she belongs.

Today, the USPTO is seeking comments from the public on the participation of women, minorities, and veterans in entrepreneurship activities in the patent system. In particular, we note that the USPTO believes businesses, among others, have relevant information on the number of and benefits from patents applied for and obtained by women, minorities, and veterans, as well as small businesses owned by these groups. I'm here today to voice Facebook's support of this initiative and to encourage the USPTO, universities, and other institutions in the patent ecosystem to provide education to participants of the patent system about the issues highlighted by the SUCCESS Act.

I'm also here to describe Facebook's efforts in closing the equity gap in patenting -- in inventing and patenting for women, one of the key aims of the act. Innovation is at the heart of Facebook's mission. We invest a significant portion of revenue in the innovation of products and services to connect the world. In fact, in 2018, Facebook invested over $10 million into research and development, which is almost 20 percent of its revenue. Because the patent system plays a critical role in protecting and facilitating the ability of our engineers to innovate and to
introduce these products and services to the world, Facebook supports a strong but balanced patent system that promotes innovation.

Facebook has been and continues to be an active participant in the patent system, with well over 15,000 patents related to hardware, software, including virtual and augmented reality, infrastructure, connectivity, communication, commerce, and artificial intelligence.

While a robust patent system is necessary to drive growth and stimulate innovation, diverse perspectives are just as critical to fuel research and drive growth. In particular, women, minorities, and veterans bring with them these diverse perspectives in the form of fresh ideas and valuable insights that greatly impact the development of these products and services of the future.

However, since women have -- in particular, have been historically have lower rates of participation in technical roles, businesses have routinely lost out on their diverse perspectives, leading to stymied economic growth and innovation. In fact, in the report entitled "Progress and Potential: A Profile of American Women Inventors on U.S. Patents" recently issued by the USPTO, it suggests that women's innovative potential is being
underutilized and that women can be considered lost (indiscernible) in science, people who would otherwise contribute valuable inventions if they had early exposure to innovation in the inventor roles.

The report further suggests that harnessing women's underexplored talent would be valuable to spurring innovation and tracking growth. At Facebook, we are actively striving for a diverse workforce. The percentage of women in technical roles has increased from 15 percent to 22 percent in 2018, according to Facebook's fifth annual diversity report.

While the number of women at Facebook has increased five times over the last five years and the number of women in technical roles has increased over seven times, we are still actively working to increase the number of women in technical roles so as not to lose out on our lost (indiscernible) science or rather, what we refer to as our lost Marie Curies.

As of February 2019, 24 percent of Facebook's organic patent applications named at least one woman inventor, and we would like to see that number continue to climb. Facebook recently launched an internal diversity initiative specifically aimed at increasing the number of women who make patent applications. The initiative includes a number of efforts
focusing first on increasing access to and visibility of the patent process to women within the company.

The patent team at Facebook is developing programs to provide additional education to women, about patents and the process by which patents are obtained at Facebook. We are also planning to host a career panel with prolific women inventors who will talk about positive impact that patents have had on their careers. Additionally, the patent team is hosting patent harvest sessions for women, led by women. Each of these initiatives is introduced with a specific goal of achieving gender disparity in patenting.

Further, Facebook is not only interested in addressing gender disparity in patenting but is also interested in better understanding the barriers that women face in participating in Facebook's patent program. To that end, Facebook will be collecting feedback from women on their experiences with Facebook's patent program so that we can identify and address these barriers.

While these initiatives are internal to Facebook, we are also interested in advocating for change in the tech industry at large by partnering with the USPTO and other companies and associations. Facebook has committed to using the Intellectual
Property Owners Association's achieving gender disparity in
innovation toolkit. In using the toolkit and obtaining results,
Facebook is looking to provide feedback to the IPO, as well as to
the USPTO, about our barriers and about best practices we have
implemented to address these barriers. In doing so, Facebook is
hoping to set an example and encourage other businesses to do the
same to effect and scale positive change across the industry.

Although we have already kicked off a number of programs
focused on diversity among patent applicants, we recognize that
it's a complex problem that needs to be addressed wholistically.
Studies indicate that's the skilled labor shortage in America
could create 85.2 million unfilled jobs by 2030. Facebook is
committed to helping reverse the skills gap in America by giving
individuals and companies the tools they need to flourish in an
increasingly digital economy, which also will increase diversity
in jobs that require digital skills, like coding and digital
marketing.

Last year, Facebook pledged to train 1 million U.S.
small business owners by 2020 and equip more people with digital
skills they need to compete in today's workplace. As part of our
pledge, we have expanded a digital training program to 50 cities,
partnered with over 60 organizations and dozens of community
colleges across the country. We also launched an e-learning program called Facebook Blueprint, which includes classes available in 14 languages with over 80 online courses. Our Blueprint team works with local associations, such as the Small Business Association, America Small Business development centers, and national small business associations to offer free in-person local training events leveraging Blueprint curriculum. Thousands of U.S. small businesses have already been trained using Blueprint, and by 2020, we plan to train an additional 250,000.

Facebook is also committed to doing business with diverse-owned companies because having diverse suppliers helps us build better products for our global community. Facebook supplier diversity connects qualified diverse-owned businesses to our fast-moving community while also helping these companies grow their businesses on our family maps.

In 2017, Facebook spent $233.6 million with U.S. companies certified by both private and public organizations as a majority owned and operated and controlled by racial and ethnic minorities, women, veterans, LGBTQ people and differently-abled entrepreneurs. Of that investment, 145 million went to minority-owned businesses, and 92 million went to women-owned businesses. We believe that our broader efforts to enable small
businesses and promote supplier diversity will contribute to more
innovation and greater diversity in the inventor community.

Facebook has contributed to increasing the
representation of women in filing patent applications and believes
that the USPTO is well positioned to provide the industry at-large
with data of women's entrepreneurship and inventorship on patent
applications. Facebook is excited to support this initiative both
internally and across the industry, and we're grateful to partner
with the USPTO on this important effort. Thank you.

MR. CABECA: Thank you very much.

So that concludes our scheduled public testimonies. I
just want to take a moment to thank everybody for their
testimonies thus far and appreciate everyone for taking their time
out of their busy days to participate in this important effort in
partnership with the SBA.

And I want to take the opportunity now to open the floor
for anyone that would like to make public comment that has not
already been recognized.

Okay. I always heard wait five seconds.

All right. So, then, since there is no additional
open-floor testimony, unscheduled testimony, other than the one we
had earlier this morning, I'd like to move towards our closing
remarks and close up the program.

I thought it would be important, in closing, to talk
about next steps so that you have an understanding of what we're
going to do with all of this wonderful information. So we have --
as we mentioned before, we have one more public session, one more
day of testimony we'll actually be doing in our regional office
located in Detroit, Michigan, on June 18th. After that, the team
plans to digest and deconstruct all the public comments and
transcripts from the three roundtables -- from the three
testimonies and to start identifying where there's overlaps and
where there's some key take-aways that can actually translate into
congressional steps that the USPTO, in partnership with the SBA, can
fold into the report in a recommendation going forward to
congress.

So we plan to work with the SBA very closely in that
process as well as with other -- our Department of Commerce
agencies and other federal agencies as well to help build a
comprehensive cross-functional report that will support
minorities, women, and veterans in the patenting and -- in
promoting patenting and entrepreneurial activities.

So according to the SUCCESS Act, it charged that the
USPTO and the SBA to conclude the report within one year, so we're
being a very date-driven agency -- we don't like to turn anything
in late; what know what that means to our stakeholders too -- so
you can fully expect that the report will be out in the public by
the end of October 2019.

Again, I just want to thank everybody for participating
today at headquarters and Julie from yesterday for spending the
day with us as well and to all of you. And if there's anything
additional that we can do to help support this effort, please
continue to share your thoughts and ideas and perspectives.

With that, again, thank you very much, and have a great
rest of your day.

(At 2:59 p.m., the above hearing concluded.)
CERTIFICATE OF TRANSCRIBER

I, Bobbi J. Fisher, do hereby certify that the foregoing transcript is a true and correct record of the recorded proceedings; that said proceedings were transcribed to the best of my ability from the audio recording and supporting information; and that I am neither counsel for, related to, nor employed by any of the parties to this case, and I have no interest, financial or otherwise, in its outcome.

Bobbi J. Fisher, NCRA Registered Professional Reporter/Transcriber

June 9, 2019