Catalyzing Computing Episode 9 - Interview with Beth Mynatt Part 1

[Intro - 00:00:10]

Khari Douglas: Hello, I'm your host, Khari Douglas, and welcome to Catalyzing Computing, the official podcast of the Computing Community Consortium. The Computing Community Consortium, or CCC for short, is a programmatic committee of the Computing Research Association. The mission of the CCC is to catalyze the computing research community and enable the pursuit of innovative, high-impact research.

The following episode of Catalyzing Computing features an interview with CCC Council member Dr. Beth Mynatt. Beth is the Executive Director of Georgia Tech's Institute for People and Technology, a college of computing Distinguished Professor and the Director of the Everyday Computing Lab. Dr. Mynatt is an internationally recognized expert in the areas of ubiquitous computing, personal health informatics, computer supported collaborative work and human-computer interface design. She is a former chair of the Computing Community Consortium and has been recognized as a ACM Fellow. In this episode, we discuss her research background and experience as the Executive Director of Georgia Tech's Institute for People and Technology. Enjoy.

[Start of interview with Beth Mynatt - 00:01:10]

Khari Douglas: So, here in Atlanta, Georgia, with Beth Mynatt, former CCC Council Chair and currently the Executive Director of Georgia Tech's Institute for People and Technology. How are you doing today?

Beth Mynatt: I'm doing well, thank you.

Khari: Thanks for taking the time to sit down with me. Let's start with your background. So where did you grow up and how did you decide to study computer science?

Beth: So I grew up in Knoxville, Tennessee, but I also lived in Texas and New Jersey, and then went to school in North Carolina — [NC State](#) — to study engineering. But I really loved the control of what you could do by programming and so I switched from electrical engineering into computer science pretty early on during my undergraduate.

Khari: So then you got your bachelor's in computer science?

Beth: Yes.

Khari: And then your master's and your Ph.D. at Georgia Tech?

[Transforming graphical user interfaces into auditory interfaces - 00:02:03]

Beth: Right. So I came to Georgia Tech, did my master's and I thought I was going to do AI, and then I thought I was going to do software engineering, and then I discovered the field of [human-computer interaction](#) (HCI). So by the time I was finishing my Ph.D. I did my dissertation in that area.

Khari: So I wanted to ask you about your dissertation. It's on [transforming graphical user interfaces into auditory interfaces](#). Correct?

Beth: Yes.

Khari: So can you talk a little bit about that and the research that went into designing that?

Beth: So you have to time travel back to the 80s when graphical interfaces were first being introduced into the commercial marketplace. You're too young for this, but before then, everything was command line.

[Laughter]

So there were a great deal of blind computer professionals because they could attach a speech synthesizer or a Braille display to the monitors and they could interact with computing devices pretty much the same as everyone else. Suddenly, those little text interfaces were turning into bitmap displays with pictures of folders and documents, and that information was just pixelized, that information had disappeared from their perspective.

So, my work was first: how would you capture that information before it became just pixels? And then: how would you model that information so someone could interact with what was now a two-dimensional graphical space as opposed to essentially a one-dimensional textual space? And it was exciting work because it was fundamental to how our computer interface is created and how people interact with them and how people collaborate. But we also got to do some really neat standards work so that all interfaces on the [Unix](#) platform at that time would be accessible for blind computer users.

Khari: Okay, so what kind of strategies did you use to turn the visual and graphical content into auditory content?

Beth: Good question. So the main thing we did was we didn't go with the spatial framework. So it wasn't that something is to the left of something or something is above something else. What we did was infer the logical structure; because if it was a list, you didn't really care if it was a 2x3 list or a 4x4 list or something like that. You really just cared that it was a list, it was a selection. And so as things were being rasterized, as things were being displayed on the screen we were inferring the structure from the widgets, from the UI components.

And then you could essentially walk the structure of a graphical interface with arrow keys: up, down, left, right. But in that case, up, down, left, right...you were walking a hierarchical structure, not a spatial structure, so that would read the different parts of the

interface. And then we had fun because then we had nonspeech sounds: radio buttons sounded different than menu buttons, a text box sounded different, and as you moved up and down you heard reinforcement of that. So you had some real cool auditory icons as part of that experience.

Khari: By the sounds, you're not just saying like someone says the word menu.

Beth: No, I'm talking like sounds as in little zippers and pops. And I got to do great experiments of could people discern and identify different sound metaphors?

Khari: So were there any particular sounds that corresponded well with certain items?

Beth: Oh, I have to remember. So zippers were good for kind of scrolling up and down, so that was a little bit of a reinforcement for that. I think we had like champagne popping sounds for when something new would appear on the screen.

Khari: OK.

Beth: So if you did something and new information appeared there would be this little pop sound that went with it.

Khari: That's cool.

Beth: So I got to study, you know, [Foley sound effects](#) and, of course, it was an 8bit Mula audio back in the day, but it was a lot of fun.

Khari: How did you design the sounds? Did you hire someone to come in and make all these different sounds?

Beth: No, I was a poor graduate student.

[Laughter]

I was the one traversing all the free sound effect CDs I could get my hands on and then slicing those up. Then I did laboratory studies with undergraduates — because that's who does laboratory studies — to make sure that people could tell the differences between the sounds because, part of what was really a challenge for us is, if you're doing audio for a movie or soundtrack you hear the full audio, but if you're an expert computer user, they were just hearing the bare snippets of each sound at the beginning. So you would hear the whole sound when you were learning the system, but then, when you were using something you knew how to use, you were flying through those controls.

So one of the design challenges was that the sounds had to be uniquely identifiable at that very first little, tidbit of the sound.

Khari: Right.

Bath: So we just discovered that along the way, but it was a lot of fun.

Khari: That's very cool. So you also talked about standards. What kind of standards were those and did those progress to like the [FTC](#) or bodies like that?

Beth: We actually dealt more with the GSA, [General Services Administration](#), but probably more to the point was the [X Windows Consortium](#). Back in the day when Unix ruled, that was a standards body that ruled the libraries for how you can pose user experiences and applications. What was necessary for us was to get a very, very small little bit of code down deep in the libraries, that was essentially a hook, so that you could turn that hook on and pull the information as it was being delivered to the screen.

The point of this is that we had to be in there at that lower level because otherwise you would have to modify every single application to make it accessible and we wanted to get in at the ground level. So, you know, we had to go present the why and the wherefore and why this would be good, and they got voted on and integrated into the Unix standards. And those have essentially continued on through [Java Swing](#) and

Linux. That little hook is still there one way or the other and continues to be one of the core components for accessibility.

Khari: That's cool. You said you won an [ACM Impact Award](#)?

Beth: So [at] the [Assets Conference](#), which is an ACM conference that looks at assistive technology, we won a 10 year (it has been longer than 10 years) Impact Award last year. A little bit of the standards work, but it looked at the paper on transforming graphical interfaces of essentially setting this whole concept of how to do this and how to create usable auditory interfaces out of it. We won an Impact Award for that.

Khari: Congratulations.

Beth: Thank you.

[Time spent at Xerox Parc - 00:08:55]

Khari: So this kind of inspired your interest in human-computer interaction, or is that something you were interested in before you started this work?

Beth: So I mentioned software engineering and AI...I must have quickly become a person that was interested in the people side of computing and how they work together and HCI was just starting to go gangbusters at the time I was in graduate school. Someone came to our lab with this question of how could you hear a graphical interface? Well, that's just too interesting to resist. So, part of it was because that problem was so fundamental and cool.

Khari: So what did you do after you got your Ph.D.?

Beth: So I did discover that if you do audio interfaces and assistive technology, the intersection of those two fields is about the smallest pond that you could be in. I think all five of us, we knew each other well. So I struggled with the question of should I go

straight into a professorship, in which case I would be writing proposals pretty much in my same area, or was it a good time to pivot?

And so I decided to join the research staff at [Xerox PARC](). So I moved out to the West Coast, got a very expensive little place in San Francisco, and at that point I had proposed and interviewed to join the ubiquitous computing efforts there. I came in as the audio girl, the person who could look at ubiquitous computing environments and not only their visual design and their physical design, but their auditory design. And so that's how I snuck into Xerox PARC and then just got to work on a host of fascinating projects.

Khari: Okay are there any projects in particular that you want to talk about?

Beth: So I think, you know, it was the very beginning...Again, you have to time travel back: we didn't really have cell phones; my laptop computer was a spark book that cost $18,000; we didn't have this notion of computing appearing through all aspects of everyday life and in all these different form factors. So it was just so exciting to be at the first ground of looking at gestural interfaces, pin interfaces, auditory interfaces, but then also looking at the practices of what people would do with them.

For example, the students immediately came up with an application that had an awareness of where there was free food in the building and would disseminate that information. Student interns always live off of the free food.

[Laughter]

Khari: That's a pretty good use case I guess.

Beth: Pretty good use case. And then, of course, the equivalent of the faculty, the research staff, one of the first gestures they designed on what was the tab at the time (what would eventually become sort of PDA-like) was a gesture that you could covertly make and it would play the sound that you have a calendar appointment. So this was covertly used — if you were in a meeting that was boring you could make this gesture

and then suddenly your tab would be reminding you of an appointment that you had to go to.

[Laughter]

So, you know, that was a great part of the culture of PARC. All of us were building new experiences with these technologies, from the fanciful to the "where is the free food?". It was just a great opportunity to be there at the very beginning.

[Getting into teaching - 00:12:09]

Khari: From there you started teaching?

Beth: The interesting thing for me was I love being at PARC, it was great, but I did notice that the best part of the year was the summer when all the student interns would show up. In addition to looking for free food they were busy working on great projects and had so much energy and excitement. I started to do the math and say, "Well, maybe I want to be somewhere where the students were there most of the year, not just three months of the year." So I decided I wanted to become a professor and I applied to come to Georgia Tech because that was one of the places that was really adopting ubiquitous computing as a research program.

Khari: When you first started teaching, what kind of classes did you teach?

Beth: So I love teaching. I started with the human-computer interaction design class, and I taught at both the undergraduate and the graduate level. That's a class where you learn about how to construct different types of user experiences. We spend quite a bit of time on understanding requirements and needs analysis, stakeholders, prototyping, and then evaluation. It's highly project based and so I end up really running it as a project studio. There's enough lectures and content to inform what folks are doing, but pretty quickly you get into project teams and I work with the students as they are molding their projects. I like that much better than traditional classroom lectures and so you have

poster sessions and judging and feedback, and you have to go out and evaluate in these different ways. That was so much fun to come in and teach those classes.

Khari: So when you first came in, were you at the...and I just wrote down the abbreviation and not the full word...the GVU Center?

Beth: Yeah. It was the College of Computing, which — I may need to go through my history lesson here — yeah, the College of Computing had been formed when I was a student here, so I came back as a member of the College of Computing and then the GVU Center started about the same time as the College of Computing. So it was an academic research center that became the home, kind of the spiritual home for a lot of us doing that work.

Khari: And what does GVU stand for?

Beth: So it stands for Graphics, Visualization, and Usability, which if you go back twenty-five years were kind of the key questions at the time. So, how do you render anything onto the screen? Graphics. How do you visualize data and how do you make sure things are usable by mere mortals? And of course, all of those things have expanded into virtual reality and mixed reality, in animation, and not just usability, but ubiquity, different notions of usefulness. So that field has just exploded since we came up with the acronym of GVU.

[Laughter]

[Research administration and the interaction between computer science and the social sciences - 00:15:01]

Khari: So from there you went to the Institute for People in Technology or...?

Beth: There were a few steps along the way. So I was Assistant Professor. First I did more work in the educational side, so I ran our master's program in human computer interaction for a little while and then I helped start our Ph.D program in human centered

[computing](#), which allowed our Ph.D students to really look at socio-technical systems as a key focus of study. So less theory and systems, traditional computer science, and more anthropology and other areas, cognitive science that needed to be brought in.

At some point around there I shifted from being an administrator of educational programs to going into research administration. So I became the fourth Director of the GVU Center.

Khari: Ok. So for those programs that you were running, were your students mostly people with computer science backgrounds that were interested in socio-technical and human-computer interaction (HCI) problems? Or were you getting a lot of, say, like cognitive scientists or more social scientists that were interested in applying computing to those problems?

Beth: So when we first started, we were getting students that kind of looked like me. People who had been trained in computer science but really liked the design or human element, so they were growing in that direction. Especially with the HCI master's students, they could come in maybe more with the design background or psychology background. Part of the reason we created the Human Centered Computing Program is we wanted more diversity of the kinds of students that were looking at socio-technical systems. Creating that program allowed us to open those doors wider.

So I was really excited. We had people who had anthropology backgrounds, museum design backgrounds, kind of everything. Much more work in kind of social justice, social movements and so we started to get those students coming in because of our Human Centered Computing Program. That was what we wanted. We wanted to see the diverse backgrounds coming in, looking at socio technical systems from a variety of viewpoints, and then asking all sorts of great questions for what they could do in their research.

Khari: Have you found handling the intersection between social science and computer science, both in terms of like on a technical level, obviously, if you have people of different backgrounds in the same center, it could be...people are

starting at different points, so that could be difficult. But maybe there's also different mindsets like when it comes to the kinds of people that study different kinds of problems.

Beth: So it's been interesting, both for our students as well as for our faculty in the research that we do, this interdisciplinary blending of computing, human-computer interaction, human-centered computing and then social sciences, anthropology, ethnography techniques, because the stereotype is the computer scientists, we're the inventors, we're the tinkerers, we're all about creating things and inventing the future. That's what we do. We don't look back very much.

And the stereotype of the social sciences is it's retrospective, right? It is historical accounts and analysis of social activity, and how people create culture or practices or communities, and how those things are socially constructed. So you take a retrospective-looking group and a forward-looking group and you shove them onto the same team, and they have difficulties sometimes figuring out how to do that...

[Laughter]

...because, you know, the first desire is well, "Tell me what to build."

It's like, "I can't tell you what to build, I can tell you what's worked in the past."

"Well, I don't care about what's worked in the past, I want to know what I should do going forward."

So it's been fun watching kind of the merger of these groups coming together more and more in different programs across the U.S. and worldwide. Ironically, we do find common ground in some of our theoretical frameworks and some of our methods around that. So what are particular lenses or ways that you look at the world.

[Distributed cognition](#) is a big one in our community. It's how information is placed in the world through people as agents, as well as physical artifacts, and then dynamic

computational artifacts. So you can look at collaboration almost as "information is bouncing around these different groups" and so you can create those networks.

So the patient chart in a hospital room is a classic boundary object within that. Doctors use it, nurses use it, different people check in, they look at it, they use it for different things. If you were going to design the digital chart, how would you look at all the stakeholders and the different uses around that? Not counting the family members who are also peering at it and trying to figure out what's going on.

That's an example of thinking about the world in a particular way, because the world is really complex. You need something to manage that complexity. Then some things are much more based in the methodology of how you do the work. So action research is an example where it is not just about research because something is interesting and will make a neat paper, but you're actually working with a non-profit or a relief agency or some sort of NGO for a goal. Or you are working with teachers in a classroom and part of your research methodology has to be about, well, what are their goals and how are they equal partners in this.

It foregrounds the notion that you have to do work that's not necessarily research work, but it's the goals of the community and how do you incorporate that as part of your methodology? And so that's another place where we've come together. It's a meeting place of the different fields where we can agree on enough to make productive progress. And then we publish those papers and people are like, "Oh, but I know how to improve this," and then they take it to the next stage.

[Socio-technical interventions for health disparity reduction - 00:20:59]

Khari: That makes sense. So the CCC has had a number of workshops and projects related to human-computer interaction. The reason I'm in Atlanta is for the upcoming Content Generation for Workforce Development workshop. We also recently had one on socio-technical interventions for health disparities.

Beth: Yes.

Khari: Which should have a [workshop report](#) soon. I'm trying to finish reading that.

Beth: Yes.

Khari: Can you talk about how the things you've just mentioned have played out? Well, this one workshop hasn't happened, but...

Beth: Well we've been planning it for a year. I think one of the things that I love about the CCC and the workshops that we do is we purposely bring different communities together. So I talked about trying to find that common ground, and sometimes in a workshop we're actually trying to create that common ground where it hasn't necessarily been there in the past.

So the workshop around healthcare disparities was finding common ground between people who are part of the behavioral medicine community — so they kind of understand why patients or people do what they do — and then the HCI people, like myself, and people who also work more deeply in health informatics and tend to be based in healthcare systems. A key question for us and a key realization for us is that you can create a health intervention, a mobile health app, and it can be usable and it can pass lots of tests of is it designed well, but you actually put it into practice and, let's say, that it picks up on cultural values of one group but not another. You could actually land up increasing or exacerbating healthcare disparities through putting these things out there, in an unintended consequences kind of way.

For example, some health apps are very much around the [quantified self](#). You gather your own data, you inform yourself, you reflect on your data, you set goals, and you achieve better things. That's coming from a certain set of individualistic values of how people operate, and then there's other health apps that are very much based around a community sharing best practices and encouraging each other and having expertise in a community that's not necessarily medical expertise.

So the workshop laid out this difficult terrain for us to say, "Okay, as a research community, how do we come together to inform the work that people do so we can avoid some of these unintended consequences? And then, more importantly, how do we create these shared methods, or new methods, so that when your very young, bright-eyed, Ph.D student is working in the space, they don't kind of fall into some of those same traps?" It was a set of difficult conversations because by definition, the unintended consequences are unintended.

[Laughter]

People don't want to cause harm, but they may...by following, kind of, the tenets of what you can do with some of these technologies, they may accidentally be doing so. And we're starting to understand that space. There's some things you can look for like the educational literacy necessary to use an app, but that's just scratching the surface on understanding that if you're requiring someone to individually go and download something from the app store and use it all by themselves, that's very different than if you're deploying it and maybe you're working through faith-based organizations or school systems or other groups.

It's too easy to make those individual apps and maybe we need to push our community to do things that are perhaps a little harder to create and harder to evaluate, but could have more pervasive positive impact.

Khari: So one of the things the report talks about that you sort of mentioned is the difficulty recruiting and then maintaining people that are being affected by these health disparities, because in a lot of situations, one, they might not be quite so health conscious, which is part of the reason for the disparities in the first place, and also due to both legitimate and perceived notions that people would misuse this information, their health information, if they gave it up. How do you address this in projects that you've run?

Beth: Right. So that you have a lot of trust issues, privacy issues when you're designing into the healthcare space. Trust maybe in the technology, trust is also within the

healthcare community. So different socioeconomic groups have had different experiences with how much they can trust healthcare providers or how much they actually feel that those providers are acting in their own interest. This notion of how you build in layperson leadership and expertise within an app can be very important. Who you can have easy access to when creating those apps is a real challenge. I joked that when I did my Ph.D. work I tested my sounds on undergraduate students in psychology because that's the easiest population to get access to for anybody doing research. But that's not a great population if I'm looking at how people in rural Georgia who were diagnosed with breast cancer manage all of the barriers that they face to get treatment.

So, as I said, part of this is actually putting the onus on the researchers to go literally the extra mile and find ways of engaging populations in true participatory design so that you're creating something that can be of value to those communities. And it is harder work than just building something in your lab and testing it with who's walking down the hallway, but if you look at what the pharmaceutical industry has to do or should do, you know, they've had a lot of critiques about, for example, only testing in white men.

So these drugs work really well for heart disease for white men but maybe not so much for other groups. Well, digital technologies can fall into some of the same traps, it's just that our subjects of convenience are maybe undergraduates or people who are fluent, who already have access to these technologies, early adopters of technologies. That makes it easier to get to, but part of the point of this workshop was to show that you will get different results and you maybe need to have a fundamentally different approach when you're looking at larger socio economic groups.

[Funding for long-term, healthcare-related studies - 00:27:24]

Khari: So I guess this is kind of maybe a diversion, but...

Beth: That's okay, I'm getting kind of preachy.

[Laughter]

Khari: In terms of researching things like health disparities, it seems like you would want to have long-term, sort of longitudinal studies where you collect a lot of data. I don't know what the funding situation is like at the Institute for People in Technology, but have you ever had any issues in terms of being able to fund long-term projects that would address these kinds of questions?

Beth: Everyday. This is a key challenge.One of the things that we talk about at IPaT — the Institute for People in Technology, but we also talk about this nationally with the CCC — is what is the capacity, we refer to it as continuity and capacity, that we need so that people can do this type of impactful research. A workshop that CCC ran quite a few years ago was about access to web information for people with disabilities. It was actually…

Khari: the [Inclusive Access](#) [workshop].

Beth: Inclusive Access, it brought me back to my Ph.D. days and my dissertation work. Some of those challenges continue, except in this case, as you know, web-based interfaces and especially media technology. I was, in my Ph.D., asked how buttons and lists and scroll bars….how do you know that the person is smiling in the video? Different types of effective information as well. And one of the things that we heard from the researchers was, "Well, you know, I work in computational perception" — these are the folks that are doing the visual analysis to understand whether someone is laughing or grimacing and be able to do that in a profound way technologically — and they would love to test these types of approaches, but then they don't also have the time and capacity to go find visually impaired users and see if this would at all be meaningful.

So part of the capacity that our research community needs is access to those individuals that lower the barrier to doing good research. So one of the things we always talk about in CCC workshops and we talk about with federal agencies is, what is the research infrastructure that the community needs? Sometimes it's data sets, sometimes it's easy access to populations for us to be able to move the needle forward in these ways.

It makes sense to a lot of folks that astrophysics people need these big telescopes. They need to be able to peer into the universe and it makes sense to pull a lot of resources together to make that available to them. Well some of the things that the computing researchers need also require pooling resources, but what they may need is lowering the barrier to working with different communities, to working and to understand different types of needs and the socio-technical impact of the systems. That need is just as great for us as those big telescopes. But it's harder for people to envision that in quite the same way.

[Beth's dream research center - 00:30:30]

Khari: Right. So if you were gonna build your sort of dream research center and budget is no limit. Money is not a problem.

Beth: Are you writing a check?

[Laughter]

Khari: What would it be and what would it do if you had to narrow down to a few things?

Beth: So the hardest part are these sustained partnerships and deep access. This is one thing that we try to do at the IPaT with a very limited budget. How do you make it so that a new faculty member, a new student, can walk in and then suddenly have a wealth of access to...You want to understand how faith communities can impact the nutrition and health practices of communities. And boy wouldn't it be nice if you just walked in and immediately had access to those communities, and then you had funding for the people in those communities that we're working with so that they weren't doing it just out of the generosity of their own heart, but they're actually compensated to be part of that research program. And then you had the ability, as you said, not to just deploy something once or test it once, but we want to put this and we want to understand if in a decade we start to shift the patterns that we see, whether it's around childhood obesity

or around mental health or opioid use. These really long term, seemingly impractical questions.

We need the ability to set up those long term research partnerships, and the way that most funding comes in small chunks, and mostly compensating the researchers but not everyone else, it's very difficult to set those partnerships up.

Khari: That makes sense. I guess if anyone from a funding agency listens to this…

Beth: The address is 75 5th Street.

[Laughter]

[Content generation for workforce development - 00:32:24]

Khari: So sort of related. Obviously, the Content Generation for Workforce Training workshop hasn't happened yet — so you might have a better answer after this, and depending on when this episode comes out, if we record something after that, it might come out before this — but you mentioned the difficulty in terms of getting participants in the studies who are able to use technology. There's obviously a barrier.

I was reading an article somewhere, maybe The Washington Post or something, about the struggles one particular city was having getting people to retrain when they were laid off from working in a factory. There was an example where this guy quit the program, the retraining program, basically, because all the information was in PDFs and he couldn't figure out how to put it onto a flash drive.

Beth: Mmm, yep.

Khari: To me, that seems like an easy problem to solve, but that's obviously because I've grown up...

Beth: You do that everyday.

Khari: Right, I do that everyday. That's a difficult problem for someone who's 55 and has never had to do it before. So what sort of strategies have you used or do you think would be effective to help combat those kinds of problems?

Beth: Yeah, it's interesting. As you said, we have this workshop that is the CCC convening power. We're going to have people who do advanced content creation, so we're talking the best of the graphics community and the special effects community. People who are also winning Oscars for special effects for great films, the best of the best. And then we're going to have learning scientists, people that understand training and learning.

Then we're going to have folks that represent those communities and those folks that you're talking about. Where you're looking at individuals who have not grown up using these kinds of technologies and then suddenly that's being foisted upon them for job security or new avenues. And it is a wickedly difficult problem to figure out what those onramps look like and to understand how you create technologies that don't just put someone in that consumer/user perspective, but put them in a producer perspective.

Khari: How do you...What's the distinction?

Beth: So a distinction is...a lot of this shows up in educational technologies as a whole. There is the question of do you learn something by being talked at and then tested on, and you're just the consumer of the technology vs. do you say, well, what's the most important thing you would want to do.

So let's say you're going to change how line work is done on this assembly, what's the first thing you would want to do? Well, you've had safety concerns about such and such. Alright, let's teach you how to do the simplest thing to help do a checklist or monitor for those safety concerns. And it's not that the technology got any easier but when you connect with someone about a goal that they fundamentally have suddenly, maybe that motivation to overcome that little barrier, it happens, and then they move to the next stage and to the next stage.

So too often we have this "these people create and those people consume" as opposed to "these people create tools or platforms and then these people do great and interesting things with it that are locally meaningful to their community, to their factory, to their job." This is why, if you go back in history lessons, the spreadsheet was so powerful, because everyone picked it up and started doing a hundred different things with it. And now it's way more complicated than it was back then, but it was a tool that enabled people to pick it up and do something they thought was meaningful and we lose that sometimes. So when we're looking at these hard questions of bringing new populations into computing technologies, we have to actually say, "how do we make them powerful with what we can hand them as opposed to how do we make them do things differently?"

Khari: Right, hmm.

Beth: It sounds harder, and maybe it is, but that becomes way more powerful.

[Outro - 00:36:47]

Khari: That's it for this episode of Catalyzing Computing. Tune in next week for [part two](#) of my interview with Beth Mynatt. In that episode, we discuss digital self-harm, [Shoshana Zuboff's](#) latest book, [_The Age of Surveillance Capitalism_](#) and the work of the CCC's [Intelligent Infrastructure Task Force](#). If you enjoy the podcast, be sure to like and subscribe. Tune in next week. Peace.