Business Technology Symposium – 2019

JOE COMPEAU: Hello, and welcome to this year's version of the Business Technology Symposium. So thanks, everybody, for coming out. I'm Joe Compeau, clinical associate professor and MIS here at the Carson College. And I'm pleased to kick off this year's business technology symposium. We have an interesting and informative discussion for you to help you understand sort of the connection of technology and business, and how they work hand-in-hand, and a little bit about how you can build your career out using those concepts around business and technology and how they work together.

But before we get started, I would first like to thank our sponsors Steve and Cyndie Tarr and Mike and Amy Dreyer. Without their tremendous and continuing support, this event would not be possible. In addition, the support and hard work of the MIS Board of Advisors, especially in their help with speakers, is key to the success of this event. Lastly, I would like to recognize all of the hard work and support we get from the event staff and the Dean's Office here at Carson College.

So now I'm going to hand it over to Joan Qafoku, our 2015 graduate here at WSU. We were talking about this earlier, I was going to butcher his name. And I apologize.

Anyway, he's going to talk to us about his experience-- because it wasn't that long ago that he was sitting where you are-- and introduce our featured speaker. So, Joan, it's all up to you. Thanks.

JOAN QAFOKU: Thanks.

[APPLAUSE]

Awesome. Thank you so much, Joe, for the introduction. And my name is Joan Qafoku. It is a very confusing name. I've met some of you, and I think you know that my name is very confusing. So cat's out of the bag there.

Thank you guys so much for joining this year's Business Technology Symposium. I know that many of you are here out of your own goodwill, and not necessarily just for class credit. Am I right? There's no class credit being offered in any way today, as I've heard. OK, great.

We're really happy to have a discussion for you around key concepts in technology and business, and how they're relevant. Ultimately I think what's important for a lot of students to understand is that all business leaders in the future need to be technology-proficient and technology-capable. And that's something that all of you should be thinking about as you're in your classes today, and learning about what you want to do with your careers. It's extremely important to go into a career that's going to be defining the way that businesses and technology adopt and get built out over time.

So I think that as a student taking courses in the Carson College of Business, you will be exposed to a lot of courses that teach you about fundamental concepts in business and technology. And I myself have been a student in this exact program. I graduated about four years ago from the Carson College of Business in the Management Information Systems program. And I remember sitting in this exact seat watching the Business Technology Symposium in the past and thinking to myself, how do I translate what I'm learning in class to what people are talking about here on stage.

And it's a hard question to answer, because it seems like these are very abstract concepts, and it's not something you can put your arms around necessarily. But I assure you that the more you get into the major, the more you understand the relevance of technology in business, the easier establishing that link is going to be.

And for me, the first step in understanding how technology and business work together and how I can contribute to that was my very first internship. I had the opportunity to intern for the Pacific Northwest National Laboratory when I was a junior in the Clarkson College of Business. And that was the first chance that I had to go and apply a lot of things that I was learning.

I remember walking into the orientation, sitting through all of the HR training, and then meeting my mentor at the time and walking into my desk. And he sat me down, explained the outline of the project I'd be working on, and then showed me a book on a piece of technology that would perform machine learning and machine analytics that I was supposed to learn and helped contribute to.

And I remember thinking to myself, I had no idea where to start. I had no idea how to begin doing anything in this project. So I turned to the only thing that had guided me through all of college, and the one thing that had always been there for me. And that of course is Google. I just googled, incessantly, how to do things, how to learn. And that's the one thing that I think college teaches you and prepares you really well for. It's the ability to learn how to learn. It was through that process that I was able to pick up this tool and this technology, and learn how it applied specifically to the project that we were supposed to deliver.

But it didn't necessarily give me the context into the business value. That's something that I learned over time, working with many people at the lab, and working with folks to understand ultimately what we were trying to deliver and why that was important.

We built a series of analytics and reporting to outline how a customer traverses through IT, how they interact with key systems, and tools, and technology. And it was through that process of understanding what the customer needed and how the customer was interacting with IT that I realized that's the point of everything that we're doing. It's not just about learning a great innovated new piece of technology. It's about applying that and learning about how that's going to actually help enable and drive the business. That's an opportunity that many of you have here as students. It's an opportunity you have to understand the purpose of technology, and what it's actually being applied for, not necessarily just learning how to do cool things with

random tools and software that you're learning. And hopefully today's discussion will guide you through that and help you understand the greater impact of technology to business.

So I'm very pleased to see the great turnout today. I'm very pleased to introduce our guest today, and hopefully have a great fireside chat and conversation afterward, where we'll be talking about some of the key themes in business and technology. And with that, please help me welcome our guest, the chief information officer and associate laboratory director for PNNL, Mr. Brian Abrahamson.

BRIAN ABRAHAMSON: All right. Thanks, Joan.

[APPLAUSE]

I'll tell you, it's great to be here. I'm a Zag, just to be clear. But I have a brother who is a Coug and a sister who is a Husky. So I am Switzerland in our home. But a beautiful campus and a great turnout.

So how many have heard of Pacific Northwest National Laboratory, just by show-- oh, some of you. Good. Coo. I lead our communications and marketing department as well, so I always like to see more hands.

So we are about a billion-dollar research laboratory that sits just a little bit-- if I get the directions correct-- southwest of here. We're headquartered in the Tri-Cities. In our Tri-Cities campus, we've got about 4,000 scientists, engineers, and support professionals that are innovating every day. As a research laboratory, we tend to try to innovate about five to 10 years ahead of where commercial industry is investing.

So we're doing this across a whole span of functions. We do a lot of environmental research, climate sciences, we do a lot in energy and the next generation of the grid, we do a lot of work with battery technology and innovating the next-generation battery, all the way from consumer to grid scale. About half of our mission is national security. And much of that is a classified mission, but we do a lot of work in nuclear nonproliferation, kind of understanding what bad guys are doing. We have a huge mission in cybersecurity.

So it's an interesting place to be nonetheless. And I have the privilege of being our-- as Joan said-- our chief information officer there. And I've been there for about seven years, going on eight. And it's just a great example of-- and I'll talk a little bit about of how technology is kind of underpinning a business like that, and underpinning a lot of other businesses, pretty much every other business out there, and kind of what that means.

So a little bit about myself before I kind of get into some perspectives on business and technology value. So I started out, actually, as a journalism major. I went into college, and I like to write, and I said, well, I can do journalism. This sounds great. About four or five months into my first year, I discovered that we had career counselors and people that did career advice. And

I went and sat down, and they pulled out this thing called a salary chart. And oh my gosh, journalism.

[CHUCKLES]

I can't be a doctor, I don't want to do engineering. And so I ended up actually going with a computer science degree. Having done that all over again-- and I'm not saying that because I'm sitting in the Clarkson College of Business-- I would have done an MIS degree. It's where my career has taken me.

So I want talk to you a little bit about what that means. When you think about what IT means today, what technology means today, we are honestly sitting in nothing short of a digital revolution in terms of how businesses operate. Businesses have always, for many decades at this point, been underpinned by technology and by systems, organizations, institutions like WH itself, any organization you work with. But think about what's changing. When you think about the advent of the Internet of Things, everything is now connected-- billions of devices connected, the data that's getting generated. Everything is instrumented. Think about your experiences as a consumer, how you can get what you need, when you need it, in the context of who you are and what you're doing. Think how that's changing.

You hear a lot about cloud-- big organizations like Google, and Amazon, and Microsoft putting forth these platforms that can be used and shared by many institutions and organizations that really accelerate what you can do and how you can do it. And then take, as another trend on this cybersecurity-- as an institution, a lot of our work is fairly sensitive intellectual property, and we do a lot of classified work for the US government. We're a fairly significant target from some pretty bad people out there, from a cyber perspective.

The sophistication of the cyber threat is growing exponentially in a scary way. And you think about, when you read about organizations and companies that have been compromised from a cyber perspective-- you can't go a day or a week any longer without seeing those headlines in the paper-- that is really significant. It has a really significant impact on business value in the same way that things like cloud, the evolution of what data is, and explosive growth of data is doing as well. So you think about all these kind of trends coming together.

The one thing that I would share, though, is-- and I'm going to talk a little bit about if there is one ingredient that, as you think about traditional businesses today, is over time-- and the older a business is, I think, the worst this has become-- they become very complicated. The way that they run is complex. They're often subject to a lot of requirements, to regulators, to all these different things that make them have kind of bureaucratic processes, and ways of working, and things like that.

So you step into an organization and you see all this complexity. And the complexity is frustrating to people because you're working there, and you're trying to get something done, and all of these things get in your way. The complexity drives huge inefficiencies. It's expensive.

So take that complexity, and then mirror that against one thing in this room that we all share in common. We're all consumers. As consumers, think about the technology you have access to every day. Think about everything that you can do with this device. It's simple, it's easy, it's intuitive. It's there when you need it. It's in the context of who you are, what you're doing.

If you drive over to the Costco parking lot, and Google will take you there. It will tell you what time of day the traffic is low to go to Costco, because it's tracking the GPS signals of people driving. That kind of simplicity, that kind of advantage is hitting you every day as a consumer.

And then think about being a technology professional in a contemporary environment today, where you come to work and you don't have that same kind of experience. Think about the dichotomy between those two things. And this is what's driving, in a large part, the need to simplify the way we work within organizations and businesses, and doing that through the use of technology. People don't walk around anymore with clipboards. They walk around with iPads. The way people work-- if you sit inside any kind of workplace today, technology is, for the most part, underpinning most of what people are doing.

And when you think about the opportunities to simplify the ways of working that is, I think, one of the single biggest trends. And I tell you, there's a quote from Leonardo da Vinci, which is, "Simplicity is the ultimate genius." And that's probably my favorite quote ever. Because at the end of the day, simplicity is something that is really easy to say but really hard to do.

It is easy to make something hard. It is easy for businesses to just tack on one requirement after another, after another, and make things hard, and complicated, and bureaucratic. It takes a lot of creativity to step in and say, well, wait a minute. How do I simplify what you're trying to do? How do I maybe leverage some technology to make it faster and more efficient? And how do I improve the workplace experience as a result, in a way that makes a difference?

And I would argue that today, when you look at what differentiates the good from the great in companies, the degree to which they're using technology and digital innovation to kind of change the way they work, it's the most significant differentiator from good to great today. That's how businesses are competing.

And if you think about your life as a consumer, you see that same thing. We all choose where to bank. I won't go with a bank that doesn't have a mobile app that allows me to take a picture of my check and deposit that check. Who's going to drive to the bank, and go through the window, and do all this stuff?

So in the same way that companies are fighting for consumers through technology, and creating experiences that make you stick with them, companies internally are fighting for employees, and creating experiences in the workplace that make the employee stick with them. It's incredibly important.

And when I think about-- you're all either in a program, or in MIS, or you're thinking about MIS, there is no more important role, in my experience, than that of people that can bridge the gap between those that understand what the business is and how it runs-- the business professionals-- and the technologists. Something like MIS honestly sits right in the sweet spot in the middle of those two things. You understand, you're technology-savvy, you know enough.

You don't need to be somebody that writes code. But you need to be able to translate what the business needs to what the developer's doing. That translation skill, that translation capability, having a foot in both camps, is worth its weight in gold quite honestly. And that is something that a lot of organizations today, as you think about the overly-complicated bureaucratic challenges and things that a lot of businesses are facing today, re-engineering the way things work, applying technology and digitization, knowing how those things come together-- because on the business side of the equation, if you're not very tech-savvy, you don't even know what to ask for.

You can be a great technologist, but you don't necessarily understand what the business needs are, what the creativity could be on the business side of equation to change the way something happens when you can bring those two things together. I think that's where a lot of organizations are focusing a lot of time, talent, and attention.

And in terms of my own experiences and career, it's been interesting. And so as I came out of Gonzaga, I went into management consulting. And I spent a little over 10 years with what is now called Accenture. It was back then called Andersen Consulting. And I got to work in about 20 different companies. So I would stay in stints from anywhere from maybe six to nine months. And that was a great experience because you go into an organization, and you're there long enough to kind of understand what the challenges are, and what the culture of that company is, and how they're approaching it.

And in my consulting career, it was fascinating. Because those companies that were outperforming, every single time, were the ones that had the translators in the middle. They understood. Those companies that were struggling, you had a bunch of technologists that understood technology, you had a bunch of business people that understood the business, and ne'er the two ever came together-- really, really challenging. And so you see that time and again. And that was an interesting case study for me.

After I left consulting, I went-- before I was at Pacific Northwest National Laboratory, I was down in the Bay Area. I was the CIO at Pacific Gas and Electric, in the days that they kept the lights on and they were not bankrupt. But it was an interesting experience. Because again, same kind of experiences in that respect.

And so that's where one of things I would encourage a lot of you is, as you think about your path forward and your career, don't just think of IT as the guy or gal that can go six layers deep in a software stack from a software engineering perspective-- or that is a deep infrastructure expert or specialist. Those people are incredibly valuable and very necessary, but those folks

that can bridge the divide between business and technology are huge, and they're instrumental.

So I think that's a little bit about-- as we think about our time today, we wanted to just talk about some kind of general perspectives. And I think we've got some questions that we'll do as a part of a fireside chat. And then we can take some questions from the audience as we go.

DEBBIE COMPEAU: Super. So we will move into the fireside chat. My name is Debbie Compeau. I am the senior associate dean for Faculty Affairs and Research in the Clarkson College of Business and the interim department chair in MISE. And I'm really glad to be able to have a chance to talk a little bit more to Brian and to Joan about their experiences, and some of the questions that I think it provokes for you as you think about your business careers, and whether your business career is going to be as one of those tech-savvy leaders or a technology professional. And either of those careers, we hope that we can help you get some ideas today for some things to think about.

So Brian, I want to start with a question for you, given your longer experience. We work in a field of rapid technology evolution-- and you and I talked a little bit at lunch about things that we remember from when we were starting out that are things that are, well, kind of old. Sorry.

So change is inevitable in our field, no question. But I wonder if you could reflect a little bit on some of the things that haven't changed over the time of your career and then some of the things that have.

BRIAN ABRAHAMSON: Yes. So the thing that has changed is easy. It's technology. I mean, there is a new thingamajig-- a new language, a new trend, a new breakthrough-- every year. Today it's machine learning and artificial intelligence. We've all heard a lot about machine learning and AI for years. The fact that's becoming real right now, and it's having real impact in businesses and organizations of all kinds is a significant, near-term change.

But that causes you to rethink. So the fact that, as you think about careers as business professionals or technology professionals, technology is a constant change. The one thing that I have not seen change is-- well, maybe there's a couple of things. One is this persistent divide between those that understand the technology and those that understand the business, and the need to bring that together. That sounds simple. You'd think that we would have conquered that problem a long time ago. I think that still exists in a significant fashion in a lot of organizations that I work with today.

I think the other thing that I haven't seen change is those that are successful in these fields are those that have a passion to continuously learn. Time and again, I see people who, if you're in a field like this that is constantly changing who have an interest to stay ahead of where things are going, to stay current with where things are going, that they kind of ride those waves and they're extraordinarily successful.

Technology is not-- if you're not staying current with where things are going, your knowledge can go a little bit stale fairly quickly. So it's a great field for people that have a passion for staying challenged, and continuously learning, and things like that.

DEBBIE COMPEAU: And so when you think about that divide, you seem a bit surprised that that hasn't gone away. Isn't it just a natural consequence of specialization of labor?

BRIAN ABRAHAMSON: You know, I think you're right. The thing that surprises me is there is so-- I shared some of my own anecdotal experiences on high out-performing organizations, and those that can bridge that gap, and those that can't. But there's a lot of research on that same topic. This is not an insight that's unique to me at all. And so given that the need has been so clearly identified, the fact that it still exists, I think, is a challenge.

Now, to be honest, I think that that's going to change to a certain extent. I think one thing that will naturally bend that curve a little bit is folks like a lot of folks in this room that are coming up. And when you said earlier-- and you said, I turned to the one thing that was kind of always there for me, I thought you were going to say, "my advisor." You said "Google," right? That's a different perspective.

People coming up into the workforce today are naturally more tech-savvy and technology-inclined than what we've had in the workforce for many years. When you think about the multiple generations of the workforce today, we've got boomers, we've got the generational-- you've got the Gen-Xers, you've got a lot of generations who weren't exposed to technology in a lot of cases until they hit the workplace. And then their consumer experiences came after that. And so I think that will naturally shift things in a good way.

DEBBIE COMPEAU: Excellent. And maybe if I could get you to talk a little bit, then-- and to both of you-- about, in the face of that divide, that we have business and we have technology and we need to generate value from both of them, how do we work in organizations to help generate that. One of them you talked about, Brian, is the notion of people who play that bridging role. What are some of the other things that happen at PNNL or anywhere else to help to create that marriage of the two?

BRIAN ABRAHAMSON: So I'd offer a few things. One is, when we have technology professionals, we tend to try to do a lot to embed them across different parts of an institution and an organization. So they're literally walking in the shoes of people that might be experiencing some of the challenges that technology can help with. So we do a lot of embedding. Just like when you embed reporters into some kind of event, globally, they can be a better reporter and they can share the news more effectively because they're there.

So as we think about embedding technologists and people that are very tech-savvy in with different parts of the organization they bring a lot of ideas and innovation back to the table. And so these are people that know enough about technology, but in large part they understand

the domain of finance, or human resources, or marketing, or whatever part of the organization they're aligned with and supporting.

I would say one other is we tend to try to do a lot of demonstration of capability to get the juices flowing, to say, hey, if we did something innovative for one part of the organization or a company, let's go ahead and kind of demonstrate that, show that off a little bit to other parts of the organization, to start people thinking in new ways so they're thinking about the possibilities of what might exist.

JOAN QAFOKU: To that point, actually, I wanted to add a little bit. I think that there is a lot of cultural changes you're seeing in the way companies perceive IT and technology, and just the way different organizations in a specific company might utilize those skill sets. So for example, you alluded to embedding IT into different business functions. One of the things that I've seen, is with the advent of things like you like DevOps, for instance, which may be a term some of you have heard about in class. It's this idea of essentially breaking down the silos between what IT is doing, and what software development teams are doing, and what operations are doing, and kind of having one continuous flow. That cultural mindset shift, I think, is something that is starting to permeate throughout the organization.

I work with business groups and marketing and legal professionals that are concerned with cybersecurity. And you would think that that would just be handled within the information security domain. But if a company is big enough and a company is trying to scale, then you've got individual teams that are maybe running a marketing campaign. Or maybe the legal department that's concerned with privacy laws and regulations, they also have to care about information security.

So if you're talking about how do I address IT, or how do I address these subdomains, it's more about broadening the skill sets that you have, regardless of what organization you're in in the company, to have people that are well-versed in those skills. So you're kind of seeing a blend of-- marketing is not just going to be marketing professionals anymore. Marketing is going to be people that have extensive IT experience. Because a big part of marketing is marketing analytics. And a big part of marketing analytics is building out services and tools that are able to kind of analyze marketing data at scale. Those are traditionally IT skill sets, yet you're seeing marketing people that have those skill sets now.

So it's starting to kind of shift what it looks like. And that's why, to kind of take it back, the reason that the IS program or an IS major is so valuable is because you can go in any function or domain of business, and that technical skill set and understanding how that technology's going to drive that business group is going to be relevant no matter what group you're in. It's something that is really changing. All of business is essentially becoming IT. And this is a line that is becoming very blurred. And as you enter the organization, all of you that are graduating, you'll have a hard time distinguishing where IT stops and where IT begins. Because it's kind of all becoming one sort of harmonious experience, I'd say, across the board.

DEBBIE COMPEAU: And maybe I'll pick up on that link between lots of things meshing with IT. Because Brian, you said, at PNNL, you also have responsibility for corporate communications. How did that come to be, and how does that work between IS and corporate communications?

BRIAN ABRAHAMSON: Yeah. So it's partly what Joan said, which is when you think about the way people consume information today, it's all gone digital. We get everything through our electronic and digital channels. How do you understand an audience today? That's all analytics. It's all measured. In the day and age of social media and things like this, outreach is a lot different. Nobody reads their junk mail anymore. that That's quickly a-- how you get the word out.

And a lot of times, traditional communications and marketing organizations always were kind of fighting for table scraps for technology investment and for digital transformation, because the money was going into the things that maybe ran the heart of the business or something else. And so for us at PNNL, we said, well, what if we brought these two functions together, and instead of making communications and marketing fight for the table scraps, we actually converged those functions so that you had more digital-savvy expertise and things like that embedded, and available to, and as a part of a communications and marketing organization. So that's a big part of our strategy.

When we think about our investments that we're doing relative to communications and marketing, a lot of it is around analytics, and social media, and our digital channels, and what that means, and how we get the word out. Things like microtargeting on Twitter-- if you've never heard of microtargeting, go Google it. It's a fascinating, somewhat-scary concept on how, through things like Twitter, we do advanced analytics and we can figure out who are the influencers, the people that we care about. And we influence the influencers to get to this person we care about.

And so these are real things. And these are not unique to us. These are trends that you see across industry.

And how do you do that? You're not using the Twitter interface. You're going through and you're doing some level of modeling, and advanced analytics. But you're understanding at the same time-- if you don't understand marketing and communications, to Joan's point, you're not going to be very effective in doing that either. So it takes a blend of both to make that happen.

JOAN QAFOKU: And if you want to talk about-- exactly, I completely agree, Brian. And if you talk about what resonates with all of you, as I look at this very young crowd, and as I talk to students-- I know, I say "young crowd," and I know I'm not very old. But ideally I'd like to think that I have some tap on what's going on still within students. You guys are great at social media. I mean, insanely good at social media. You have an intuition for social media that is so valuable in the workplace that I don't think any of you quite realize how valuable that skill set is.

You talk about it purely through the context of social relationships, like how do I interact with influencers I care about, whose Instagram page do I follow. But what you're actually doing is learning how that information is sold, how that information garners attention. And if can translate that innate knowledge you're all developing right now-- just through the Gram, or through Snapchat, or through any of these other platforms-- into what a business can do with that information, that is amazingly valuable. And that's something that I think a lot of students underpin as they kind of go through their college experiences. There are things are tools and technologies you're using right now every single day, right now, that are incredibly valuable to a business and are going to be a vital part of how businesses market, communicate, and work with all of their customers.

And even internally, as you kind of traverse into the workforce, and you start seeing newer tools like Slack, and Microsoft Teams, and all these amazing new collaboration platforms that are really just mirroring, to what Brian said earlier, the consumer experience. These are enterprise tools that are now mirroring experiences you all have when you create a Snapchat group and it's super easy to keep in contact with all of your friends. And maybe you have a group project that you spin up a Snapchat group in, and that's the way you handle your group project. Well guess what?

Companies are doing that too, but they're doing it with Teams, they're doing it with Slack, they're doing it with other modern technical tools. And you use hashtags to track what relevant conversations are happening, you embed attachments. All of these things you're doing right now, the workplace is also doing. And these are skill sets that you can easily bridge from being a student to being in the professional workforce that I think a lot of students don't truly see the value in, and something should lean into a little bit more.

DEBBIE COMPEAU: And I think one of the things-- and I'm going to talk a little bit about some of the research that's been done that kind of bears on this is, in order to lean into that and to build that capability, it requires the ability to marry that technology skill-- if I use social media skill as a technology skill, I'm stretching a little bit-- with the business skill. It's where are we trying to generate value for the business, what's the problem we're trying to solve in business.

And I remember a study-- and it was done a really long time ago-- but it was looking at how different people used spreadsheet technologies. And they had four groups of people trying to use Spreadsheet technologies. And it was trying to use Spreadsheet technologies for a city planning task. So they had half of the people were really good city planners, and half of the people really didn't know what city planning was. I think they were actually undergraduate students, maybe in a political science kind of city planning degree.

And half of them were really good at spreadsheets and half of them were really bad at spreadsheets. Not surprisingly, the group that were really good at both did the best. But the most fascinating thing about it, when I remember looking at that study, is the group that had the most keystrokes, that did the most stuff, was the group of people who had really good spreadsheet skills and no knowledge of the task. They turned. They got in there, and they typed

a whole lot of stuff, and they did a whole lot of stuff, but they didn't know what they were aiming for. They were technology in search of a problem. And without understanding the problem, what they were aiming for, they did a whole lot of work. And they spun their wheels a lot, not knowing how to get the value. And that's what you need the two together.

The ones who did the least amount of keystrokes was the group who were really good at both. Because they knew what the tool could do, and what the problem was, and how to get there fast. And that's what we mean when we say you've got to have that blend of the business and the technology.

BRIAN ABRAHAMSON: I will tell you, it's been interesting just to reflect on that. When I think about my career in IT and technology, when I came into the workforce, the dominant skills and those that were just the de facto were people that could write code, people that could configure stuff you bought off the shelf, and people that ran stuff in data centers. Those were the three dominant, most prevalent skills.

And time and time again, what you would see is the business would have a need, they'd throw it over the wall to a set of technology professionals who didn't clearly understand the problem, they'd take something out of the oven nine months later, and it'd be zucchini bread, and everybody thought we were making pizza. You'd have these complete disconnects. And that was a common thing. In my consulting career, half the time why we would get called in is because we'd be on some kind of fix-it mission because that was occurring.

Fast-forward to today, when I think about dominant skills, the things that we are looking really hard for, user experience design professionals, those people that can truly understand what a consumer-grade experience looks and feels like. This is the art of simplicity-- how do I bring simplicity into the problem I'm trying to solve, how do I put it in front of a set of users in a way that--

Because old fashioned IT, we had these big, 20-inch monitors, and the precision of a mouse, we filled up that screen with every button-click and feature you could imagine. Think about the paradigm shift that we've all seen with this. Well, you've all had these longer. But think about the shift, right? What made this device bridge generational gaps, bridge all kinds of demographics, bridge all kinds of cultural gaps. Why did this become so popular? Because of the size and weight? No. The simplicity of, I had to do something with 4 to 7 inches of real estate and the precision of a finger, the simplicity in the design that had to be brought to bear to make this effective.

Nobody download an app and reads an instruction book. You deploy technology instead of workplace today and you say, you've got to go to a class to figure it out and understand it? Doesn't cut it anymore. So user experience design professionals are huge.

People that can do the analytics-- another huge element. We are overflowing with information today. Were information-rich, insight-poor. And so organizations today need people that can

manipulate the data, look for the trends, discover the questions that we don't even know to ask. And to do that you've got to have some domain expertise. You've got to understand the business of finance, business of operations, the business of whatever in order to do that.

The third element of this is-- I said earlier that the way we used to do stuff is we'd come up with a whole list of requirements, and we'd throw it across the wall, and nine months later the wrong thing would come out of the oven. That's not the way it's done anymore. You hear about agile, and you guys probably talk a lot about agile. That is a revolution in how you think about producing products and developing things.

You don't know at the beginning what this-- this is the "it's more art than science." You don't know what the thing you're building is going to look like at the end of the day. You have some general idea. And you iterate, and iterate, and iterate-- in the language of agile. You work through these two-week sprints. You look at where you're at. You do the retrospectives. You plan in an entirely different fashion. So the iterative nature of the way things are done today and the skill sets that are brought to bear, completely different than what you would have seen even five years ago, honestly. So some significant changes.

DEBBIE COMPEAU: All right, I'm going to switch gears a little bit and talk a little bit about technology innovation in the future. So when you think about the technology changes that you're paying the most attention to, what are the technologies you're watching the most, Joan.

JOAN QAFOKU: That's a really good question, Debbie. I think that the one that I've been paying attention to a lot recently are how organizations are taking tasks everybody does every day but doesn't really question-- like I get this email, and then I convert some of this information to a spreadsheet, that spreadsheet then fuels a scorecard of some kind that people are analyzing, and how you go about automating that.

There are a lot of organizations a lot of really innovative technology companies, that are introducing the concept of a digital workflow. And this is essentially this idea of how do you build out things-- the work that everybody does today, how do you take that off of just offline processes, and sending somebody an email, and trusting that they're going to do what they're planned to do based off of some workflow that has been identified by the company or some independent set of discriminate tools that are all interacting with each other. And how do you formalize this whole thing.

So the idea of a digital workflow is something that I've heard spoken about at several conferences. It's not one of those key terms I hear thrown a lot in the academic environment as much. I hear a lot of cloud computing, cybersecurity.

I myself work in the field of cybersecurity. I certainly think that is an absolutely relevant field. But even within the context of cybersecurity, if we examine a digital workflow, a lot of what we do in cybersecurity is we analyze and triage incidents, and create cases that we then manage. And we try to collect evidence, we try to understand what's happening across the network, we

populate that case with more information, with evidence from systems, with things that we're noticing.

And then we escalate that to a higher level of the triage cycle, and get somebody that has a more refined skill set to analyze that further. This whole process can be easily automated through digital workflow. You can have a tool, for example, that catches a suspicious alert inside of your event management or SIM system, and then sends that immediately to a reasoning engine that determines whether or not this is a false positive based off of previously-identified metrics that you've baked into this tool.

Then if it is not a false positive, if it's not something you've seen before, it then escalates that to a human being. So human beings don't look at anything until they absolutely need to. And that saves a tremendous amount of man hours in terms of analyzing and understanding what's happening, and gets people working on things that they actually should be working on.

Now if we examine what's happening within a security engineer as he's looking at this event, as he's analyzing what's going on, if he determines that this is something that can easily be remediated by IT, why should he or her have to submit a ticket into IT, and have that individual then pass off the work that they're conducting, and have IT remediate it through some separate ticketing engine or some separate tool that has to go and fill out? Why isn't that whole thing seamless?

When you talk about a digital workflow, you're talking about mapping all of these different points, where they need to communicate, and how they communicate, and putting that inside of some tool that allows that to happen effectively so that if I'm a security engineer, if I'm analyzing a case, and I'm saying, this is something where I need all of the credentials to be locked on this immediately, I can just push a button and I can have that button immediately integrate with Active Directory or whatever system it may be to deactivate those user accounts, and then continue along my analysis without having to go and submit some ticket and have somebody in IT work for it, have that kind of weird cross-collaboration that you need to have. That entire process can be automated.

This is what companies are thinking about right now. These are what the clients that I'm working with right now are thinking about. They're thinking about the tremendous amount of time that is being spent doing mundane, repeatable activities. The best way to identify if the position you're in your workforce is something that is going to be obsolete, is whether or not you can see yourself doing something repeatedly that you think to yourself could just be done in an automated fashion. If you ever find yourself in that position, I would critically examine how you can automate that, and then allow yourself to be the person that's automating things and not the person that's being automated. That's a very important concept.

And so it's really important, I think, to understand that distinction. And it's something that I think is becoming, now, with more advanced tools that are more effective at creating these digital workflows and actually executing them, you're seeing this start to become something

that companies-- it's less of a theoretical exercise-- like, yeah, we should implement automation across our company-- and more of, oh, there is actually really easy tools that do this? Why don't we just start playing around with this and start seeing what we can automate.

We're seeing a lot that a lot more of that at KPMG with the clients that we're working with. And it's something that I think, as students, there's nothing more relevant to be thinking about than automation, intelligent automation, orchestration, understanding the distinction, understanding how these things are transforming the way work is just going to be conducted generally. But yeah, that's a transformative technology I've seen. Also I have to plug cybersecurity. I am a cybersecurity professional. I do think cybersecurity and privacy specifically is more relevant than it's ever been.

And to speak about privacy for just a little bit, something that I've spoken about before with colleagues of mine is that this idea that privacy and security is just a back-office function that is a necessity to make sure that our business is covering itself in case something goes wrong is slowly starting to change. Privacy, security, these are now becoming actual value adds to products that are sold to consumers.

The best example of that-- whip out the iPhone, just like Brian's been doing-- is this right here. If any of you have seen Apple's recent advertisements and marketing around security, it's absolutely fascinating. They are marketing security and privacy as part of their product, not as something that you just trust Apple is doing, but as something they are telling you they're doing, something they are advocating for, and something that they're saying, yeah, iMessage is encrypted on both ends. You don't have to worry about anybody seeing what you're sending to each other.

This is now part of the product you're purchasing. If you look at their-- if you just go on YouTube and type in their recent ad campaigns that have come out, they show individuals interacting with products and actually using the security features of that product. And they're showing that to you because they realize that this is something people care about. Security isn't something we're taking for granted anymore. We're hearing about hacks every single day. And it's becoming very relevant and very personal. And so these things are now part of the product. Security is not a back-office function as much as it is part of the product and part of what you are buying and trusting companies with.

This exactly goes to what you were speaking about, Brian, about kind of transitioning that consumer mindset. You're kind of seeing it the opposite way, too, where now the things that we're doing in IT, the things we're doing in security are potentially part of the product that we're actually shipping to our consumers. And maybe we can translate some of that engineering expertise some of the hard work that we're doing, to our consumers to make them aware of what actually you're buying and how it's being secured.

Other concepts-- cloud, obviously AI, there are some very relevant concepts out there that I think are really going to be transforming and bending the industry in the next couple years.

DEBBIE COMPEAU: All right, and before I let Brian answer on that, I'm watching the time, and I know it is just about six minutes to 2:00. And I know some of you are here for an hour before you get to your next classes. So if you are someone who had to get to a 2 o'clock class, it is OK to make your way there now. We will not be offended. And I had already warned Brian that it wasn't going to be voting with your feet. Now if everybody gets up and leaves-- look at them all.

[CHUCKLES]

I think that's the Management 301 class. You're going to have to wait for Brian's answer.

[MUSIC PLAYING]

OK, we're going to pick up. So if you're leaving, I'll ask you to kind of keep it down a little bit so that we don't lose our momentum on this discussion. But I do want to let Brian now jump in with the most important technologies that you're paying attention to.

BRIAN ABRAHAMSON: Yeah, I would say-- as I earlier, there's so many shifts and so many trends that it is hard to keep up with. But I think the most significant is the advancements in artificial intelligence and machine learning. I said earlier that these things have been talked about and they've been around for years, if not decades. Hardware and computing power has actually caught up to the vision. And these things are real.

I'm going to give you one example. I mentioned earlier that, at the laboratory, we do a lot of work in trying to find and advance next-generation battery technology. I'll talk about why that's important in a minute. But that's an incredibly laborious scientific endeavor, in that we would think that our scientists would have very intelligent ways of looking at what combination of things would make a more powerful, and more resilient, and a longer-lasting battery.

Well, they don't. They do a lot of trial and error. The scientific method, in a lot of cases, is literally trial and error, just throw a bunch of things together.

And when you think about machine learning, one advance with machine learning is the over 20,000 possible combinations of what we call solid electrolytes were analyzed with a computer using machine learning capabilities and techniques. So in other words, it went through 20,000 possible different chemical combinations that would make up a solid electrolyte, looking for these things that would exude characteristics of something that would be work well in a battery. And typically, to go through 20,000 of these things would take about 13 years with a team of scientists and the process that they go through. There's just a lot of waiting, and cycle times, and testing, and retesting, et cetera, et cetera.

In a matter of seven days, this machine learning algorithm went through 20,000 combinations, discovered 19 high-potentials. Of those 19, the humans then got involved and whittled it down to five compounds. Those five compounds today-- there's an article about this in the journal, Nature-- those five comments today are some of the most promising battery electrolyte

combinations that are out there. And that is the sophistication and the power of what these things are.

And so when you think about some of the changes in machine learning and AI, it's no longer just in the realm of things for brainy scientists. Bringing machine learning and AI capabilities to the masses, to some of the business problems we're solving is very real. And that potential's out there. So that's huge.

On the battery side of the equation, some people kind of think about, well, gee, doesn't my 9-volt battery work just fine? Doesn't my iPhone stay charged long enough? And kind of, why are you doing this? I tell you, there's a couple of reasons. When you think about why we're looking to advance battery technology, one, sure, consumer electronics is a big market. It's a profitable market. And that's one reason. It's not the most important reason.

One of the most important reasons is good resiliency. When you think about the ability and the advancement of renewables, think about solar and wind as two major sources of power, growing exponentially, in this country and others. The problem is you can't control when the wind blows and you can't control when the sun shines. It doesn't always blow when you need the power. When you need power, the sun's not always out. So how do you do this? Well, battery technology.

Grid-scale batteries play a huge role in capturing energy produced at any time of the day, and then putting that onto the grid when and how we need it. So the ability to do grid-scale battery storage is transformative, especially-- not just in the US, because we're a little bit spoiled with the resiliency of our grid here-- but think about other countries who don't have resilient grids, that don't have the reliable, uninterrupted sources of power that we do. The power of grid-scale battery technology is huge.

And then, finally, think about third-world countries, frankly, where the concept of power plants and power lines doesn't exist. Surprising number of places on this planet where there is no power line running to your home. And so you think about the ability to do micro-grids with battery cells powered by the sun, powered by the wind, for households or small neighborhoods. There is a significant humanitarian need for that kind of thing.

So for us, when we think about our mission as a research laboratory, battery goes far beyond just the consumer electronics arena. So it's a big deal for us. And we talk about the trends-- AI and machine learning, in that problem alone, has had the most transformative effects since battery technology began to get studied roughly 100-and-some-odd years ago.

DEBBIE COMPEAU: And doesn't the advent of AI and machine learning mean that more and more of what we do, Joan, is stuff that can eventually be automated? Right now, what can be automated is the repetitive work that we think of as mundane. But in a world of AI, can't we automate, like, most of us?

JOAN QAFOKU: I think that, to an extent, yes. And I think that what you see automation struggling with are the things that humans are kind of innately better at, and that's being creative. So I think any creative process you find yourself in, any time you're actually investing time-- you want to talk about the importance of user experience and design, that's an almost exclusively creative domain. A machine learning algorithm can't really tell you how good a web page looks or how responsive somebody is going to be to, maybe, an emotional marketing campaign, or maybe any other of these kind of subjective matters. The things that live in the realm of emotion are things that human beings are just always going to have a better grip over.

So I think you want to position your career to be in a role or a position where you're kind of always thinking of how to change and innovate on things. And if you are going into the field of machine learning or artificial intelligence-- I have colleagues of mine at KPMG that are exclusively in this field. They're always examining what to automate, how to automate. But they always have to baseline it off of whether or not this problem is actually something that can be effectively automated. And to do that, they have to talk to folks.

There's a lot of conversations we're having, specifically within the context of information security, over how to automate how to use machine learning in the context of analyzing events and things that are happening across the network to more effectively focus people's attention on things that are worth their attention. And you ultimately need a human being to be able tell you what's important and what's not still. Ultimately I think a lot of the machine learning algorithms, as far as what I've interacted with and experienced, do need to be validated and be fed tests through a human being interpreting whether or not the output is what they think is effective or not. And that's the position I'd say you want to find yourself in as a professional.

Can everything be automated? I don't think so. I think there's always going to be a creative element. As we start to automate these more base-level functions, things that people do more routinely or mundanely, we're going to elevate what problems businesses are investing their time in solving. And I think that's just going to elevate the type of work people are doing, to be more creative, to be more adventurous, and then allowing those individuals hopefully to have the skill sets to be able to automate, or work with the individuals that are going to automate those outdated processes or technologies.

DEBBIE COMPEAU: OK, let me switch gears and start talking a little bit about what this all means for building your career. And so I'll ask you first, what should these students be doing today to prepare themselves for careers in IT. Then I will also ask you about what should they be doing to prepare themselves for careers in business to be those tech-savvy leaders. So first of all, what should we do to prepare for careers in IT?

BRIAN ABRAHAMSON: So here's my, I guess, semblance of that. I think what you're doing here is you're learning to learn. I will tell you that the technologies and the things that you're learning specific here today are going to be something different two, three, four, five years down the road. But the fact that you're learning how to learn is a very repeatable thing. I think that's going to serve you really well.

I think, also, making sure that as you think about preparing for a career in IT, you understand-- I described earlier what some of the different facets of skill sets we need in IT workforce are, right? User experience design, analytics, people that can be that translator between business and technologists. We need hardcore technologists as well. Where do you fit? What is the intersection of your strength and passion? Where does that take you? And there's a wide diversity of opportunity out there, and skill. So spending some time to try to understand that.

That said, I will tell you, you won't figure that out right the first time is my guess. Most people don't. And it's going to take you some time in the workforce to actually get that right. So I would say focusing right now on understanding how to learn, what kind of work you want to do, where does your center of gravity sit. And then keeping an open mind as you go out and start to work through your career, that that might completely shift on you, based on what you discover is your strength and passion.

JOAN QAFOKU: I received some pretty good advice, actually, at my time at PNNL. I worked with one of our security engineers who was a mentor to me. And he had this thing he would say where he'd say, I'm not really a huge fan of goals. Because if you set a goal five years out, for example, you might be a different person five years than you are right now. So how do you know that that goal is still going to resonate with you? He says, I like to have a sense of direction. And so that's something that I've always taken personally.

And that's not to say that goals are useless. You can certainly have goals every day, like every day I'm going to try to exercise, or every day I'm going to try to work hard to deliver this project on time. All those kind of things are great. But I think, from a career perspective, be very aware that these things are fluid and they may change and evolve over time.

And a goal set right now, five years away, a very hard goal, like let's say I say I want to be, I don't know, like a solutions architect or a very specific role that I've just like modeled myself after. And then over time you realize that you really love maybe working on certain IT tools in a more specific technical context, and you realize you want to be a very technical person as you grow out. You don't want to interact as much with customers and things like that.

You obviously can't really-- if you're dead set on that goal, it makes it a little bit harder for you to be flexible. So always be flexible. And then always look for something-- kind of to what Brian was just saying-- another piece of career advice I received that I've taken to heart is find something that you're good at, find something that you love, and find some that people will pay you for. That's kind of the magic triangle. And then if you can get something that's inside of that triangle, that's really the sweet spot of your career.

Luckily, in IT and technology, there are a plethora of things for a variety of skill sets that accommodate people that are interested. Even if you're a person that's artistically inclined-- when I first started at WSU, I began my career here, as a student, studying architecture because I loved design, I loved the structure and the engineering elements of buildings as well. And I

figured that that would be the best place for me to go. Well, guess what else deals with architecture a lot? That's IT. IT architecture is its own domain, its own field in and of itself.

And so it's not like you can't find the things that you love in a very relevant field. It's that you just have to put in the time to understand where that's going to fit and what it's going to be.

This field, I would say, has a tremendous amount of opportunity for people that are interested in it to exercise such a variety of skill sets. I'm amazed every single day with the people that I work with, and the people-- even the candidates that we interview, the kind of unique skill sets they bring to the table, whether they're very logically driven, very good at engineering, very good at building software applications, or whether they're very creative, very good with people, very good at interacting and kind of distilling what requirements actually need to be from the client, and being able to translate that to the architects and to the engineers. There's such a variety of skill sets that you just need to put in the time to understand, well, how do I want to play.

And also, your first job isn't going to be your job always. That, I think, is something that, as a student, you kind of think that if I go in and my job title is IT analyst, then that's what I am forever. Not necessarily, right?

I mean, Brian, you spoke about beginning your career in computer science, and then evolving it to where you are now. And obviously I began my career not in cybersecurity, in a more IT-specific role. I've now moved more into the security and privacy space. So there's a lot of flexibility in the kind of role and the kind of thing you do. You just kind of need to get your foot in the door and start to experience that, I'd say.

DEBBIE COMPEAU: Anything that you would offer differently for general business? I think what I heard you both say would probably apply equally to either.

BRIAN ABRAHAMSON: Yeah, I think it does. To maybe reiterate a little bit, but I think finding a career path is not about creating this of fixed map. It's about what I call wayfinding. And the thing that you need to intersect is, as Joan said, it's the intersection of your strength and your passion. It's that thing that you want to go out and do, and something that you're good at getting out there when you do it.

And as you go through, you're going to have experiences and you're going to be on projects, you're going to say, oh my God, I had never done something like that, and that really struck my passion. Or I was really good a that. Somehow I just naturally tapped into it. And I'm going to go ahead and try that, take that step. And that takes you into a direction that you didn't know you were going to go-- wasn't planned. But from a wayfinding perspective, you went there.

I mean, I started out in consulting, and I was writing code. And I have to tell you, so I had this belief that people that can sing, can also draw, can also-- those things go together from a DNA

perspective. Well, I have none of that, right? I can't sing to save my life. I can't draw a stick figure.

But for me, writing code was my creative outlet. I was creating something. I loved what I created. I was the guy that would be, 2:00 o'clock in the morning, working on my project because I loved what I was doing. If I was an artist, it would be my canvas. And I had a lot of passion around that. And I got pretty decent at it.

But one day our team lead, the person who was leading the project, unexpectedly left. We were kind of left in a bit of a rut. And I was asked-- they said, hey, Brian, you're actually pretty decent at talking to the non-technical business customer. And that's what we need on this team lead. Would you step in, and would you just, on an acting basis, kind of lead this team for a little while till we figure out what we're going to do?

I almost said no. I came very close to saying no. But I thought, you know what, I haven't tried that before. And so I did it. Well, guess what. I discovered that the passion that I had as a developer was something that I could magnify. Because now I had four, five, or six developers that I could help lead. And then I discovered I was actually good at plain talk, at describing what we were doing to somebody who didn't understand the technology. I didn't know that about myself before I did that. I had no idea, never had put that into words.

So that intersection of that strength and passion took me down a path, from a leadership perspective, that started-- if I hadn't done that, if I had not made that decision on that day, when I was working in St. Petersburg, Florida at the time, there's a good chance I'd still be writing code.

And so you just never know. And you're not going to know until it hits you. There's no such thing as a map.

JOAN QAFOKU: Something you told me early in my career when we had spoken at PNNL a couple of times is you said, don't be afraid to dive deep in technology. And I think that a lot of the skills that you were able to develop so effectively were because you were not scared of technology, and you were diving deep. And that's the same advice that I would kind of reiterate to all of you, is that you do need to dive deep on the technology. You need to love it. Because technology is really cool. You just can't be afraid of it. You need to kind of see how it works, and you need to be able to kind of get in there.

And that's what IS is all about. It's about understanding the technology and translating it to business, not just about just being the person that talks about it, but being the person that gets in there and get their hands dirty. The leaders that I've worked for that I really enjoy working for at my firm are the ones that also get their hands dirty. They're the ones that get into it. They're the ones that will help.

And there's nothing more humbling than being able to speak to one of your leaders and realize that they're learning from you temporarily because you've been in this tool, working in it more granularly, but you're seeing them listen to you, you're seeing them build their own understanding of what technical task you're solving, and then you see them work with you to develop a solution because they're not afraid to get their hands dirty and get involved. That is where I think getting deep on the technology and being passionate about it is extremely important.

And many of you probably wouldn't be considering careers in technology if you didn't love technology to some degree. And I think that everybody does. I think, as a consumer or as somebody that's learning and studying what it can do and what its potential is, it's very easy to see the potential and see kind of how I could use this to do, and what kind of problems I could solve with this, and making that your passion and growing into that role more logically, I'd say.

DEBBIE COMPEAU: I have one more question that I'm going to ask them, and then I'm going to open it up to questions from the audience. So if you've been having some questions formulated, we've got a mic over there, and do we have a mic-- yeah, we have a mic on that side as well. So if you want to make your way to the microphone while I ask my last question.

And this one is a much more tactical question aimed at our students who are currently on the job market, to get a little bit of insight into how this process works. So when you are interviewing candidates for jobs, what questions do you ask that give you the most telling answers? How do you think about that?

BRIAN ABRAHAMSON: So one of the questions that I always find very insightful is, what do you think this job is-- describe it to me in your words-- and why do you want it? I'm testing for the passion. That comes through very clearly if somebody is just there, and doing an interview, and kind of halfway understood it, or if they've got real ideas, if they understand what they think the job is. And those that have done the homework, if maybe the job description wasn't clear or something like that, they've gone in, they've talked to others at the organization, they've figured it out, they've done a little bit of intel-gathering. I always find that as a very insightful question.

JOAN QAFOKU: I would completely echo that. Ultimately passion and a love for the work, and an interest in the work will always outshine somebody that just wants to get a nice job because it's a great company and they want that on their resume or something like that. Even people that just sort of mundanely reiterate projects that they've worked on and their contributions, without any kind of spark behind it, I'd say, is a red flag.

One of the things that I try to do when I speak to students is ask them about a specific project or something that they've listed on their resume, just any random thing that I see, and ask them to just kind of describe that in detail. And it becomes very obvious if they were the key driver of that initiative, or if they were somebody that just sort of participated in that.

If you're proud of every bullet point you put on your resume, you can talk about that endlessly. And that'll show right away. So all of you, think about things you're proud of, the things that you can speak about extensively, and put that on your resume. Because then if you get asked about that thing, you'll shine. And it won't just be like, oh, yeah, that was the time where we did-- you don't say anything like that, right? Be thinking about what was the story, what was the impact.

And then people that are able to think things through, think about the bigger picture, somebody that is able to say, this project, I developed this cool technical tool that did this thing, and it was great, but then ultimately the purpose of that is this, right. Being able to broaden that out and talk about the bigger picture is something that always stands out. And it kind of points to a type of candidate that's able to think about the business value, that's able to think about why things are done, and not just that they did things. Those are the kind of candidates, I'd say, that stick out the most.

DEBBIE COMPEAU: And it's interesting, what I heard in both of their answers is it's less important what the answer is and more important what the thought process underlying the answer is. It probably doesn't matter if they can articulately and perfectly describe the job. It matters that they've taken some time to wrestle with what the job is. It matters that they can think about the projects, and why it ended up on their resume.

And that's often, when you sit on our side of the interviewing desk-- sometimes I could care less about what the actual answer is. I just want to hear how you approach the question. And that's what is so telling about you. And I think, when you're on your side of the table, you get very, very focused on the answer, am I saying the thing that they want to hear in the answer, not, what am I telling about myself through the answer.

BRIAN ABRAHAMSON: I completely agree. The other thing that I'd add to that is, when we put together what it is we're looking for, and the candidates we're going to talk to, and things like that, the top of every list that I've ever sat on the other side of is communication skills. Is this person a good communicator? Are they clear? Can they get to the point?

I have sat in interviews, and honest, you ask a question, and you start the timer because you're going to be sitting there for five, six, seven, eight, nine minutes. You know what I mean? So when you think about the importance of communication skills in today's team-based environments where you have to be collaborative, you have to be-- even if you're not the translator between technology and business, you've got to work with your colleagues, your peers, your stakeholders very effectively. Communication skills are magic. And you can very clearly often tell in an interview, is this person clear, concise, to the point, can I get there with them.

The other thing that I think weighs in on that-- and this is for sure easier said than done-- is are they comfortable in their own skin. Is there some confidence there? And confidence doesn't have to come with experience. You could never have worked a day in the workforce ever. But

you're confident in your ideas, and who you are, and the experiences, and the thought process you might bring to the table.

So the other thing is, as you think about these things, how do you walk in relaxed, confident, comfortable in your skin, clear, concise, to the point in where you go. Let the interviewer lead the interview. Let them take you where they want to go.

And don't feel like there's a perfect answer. I always joke, the best interviews I'm in are sometimes I make the candidate nervous. Because I'm writing a lot of notes. To be honest with you, I'm not actually much of a note-taker in interviews. If I'm writing a lot of notes, it's because this person is telling me something that I want to remember for myself. I thought it was really interesting. If they tell me about what they think the job is and I'm like, that's a better description-- we're going to put that on the job description next time, because it's better than what we wrote down. When somebody makes a comment, or perspectives, or shares something that, wow, that's an interesting-- that, to me, is the mark of a great interview.

And that doesn't always come with experience. That often comes from people that are new to the workforce, that say, hey, I'm not sure, but this is the way I'd approach it, this is the way I think about it, that's an OK way to answer a question. That's a very powerful way to answer a question. So don't think that there's a right answer to what you're being asked. There's often not.

DEBBIE COMPEAU: OK, any questions from the audience? If you do have a question, remember, go to the microphone.

AUDIENCE: For someone who's thinking about finding an interdisciplinary field in a way that this could intersect with other majors, what advice would you have further questions that I would have to start asking myself related to that?

JOAN QAFOKU: When you say interdisciplinary, do you mean across a technology domain and something else? Or maybe could you elaborate on what disciplines you're kind of looking?

AUDIENCE: Yeah, so a completely separate discipline, I'm thinking about either music or psychology, which is completely out of the--

JOAN QAFOKU: OK, I can definitely talk about psychology. Music, I think, definitely teaches you a lot. And if you're passionate about music, I would certainly go down that route. The other thing, though, around psychology, specific to my industry in my field, people with a background in psychology are so valuable in the field of information security and cybersecurity. And they are for a lot of reasons. We do a lot of what we call social engineering, which is kind of being able to determine how to traverse a company's physical barriers just by talking to people the right way, looking like you know what you're doing, looking like you're supposed to be where you're not supposed to be, and being able to get into places that you're not allowed to get into. That, in itself, is its own kind of subdomain of cybersecurity.

But then also, from a psychological standpoint, understanding how users interact with the design of applications, what users are looking for, how users perceive their experiences with different type of technologies or tools, those are all incredibly valuable. And we actually, even on some of our consulting projects, work with individuals with psychology backgrounds to understand maybe how to get adoption from implementing the new tool. Because we talk about what are users responding to positively, how do we build out questionnaires that are going to be able to more effectively baseline how people are interacting with our technology, or our tool, or whatever the project may be delivering.

So think about how you want to apply that skill set is what I would say. If you're going into psychology, maybe say, well, where in psychology do I want to go? Do I want to go down the clinical route? Because obviously that's its own career path that's going to involve probably graduate school and things like that. But if you're thinking about psychology in the context of business and technology, there is a need there. You just need to be able to kind of define that and articulate where you want to go. But certainly there are individuals I work with, at least, that do have that background that have applied it to technology.

AUDIENCE: Thank you.

JOAN QAFOKU: Yeah.

DEBBIE COMPEAU: I think I would pick up on that as well. Because I think one of the mistakes of higher education today is the belief that, at 18 years old, you know what degree you need to take to see you through your rest of your career. We don't. We sell business school on the idea that if you come to business school you're going to get a better job. And we do that. And there's truth to that. But it does reinforce an idea then that you should be making a decision now about what's going to take you in your career.

And I go back to what Brian said, is what you're really getting out of college is learning to learn. And so to some extent, what degree you take is almost irrelevant. Taking a business degree will help you get that first job. It will give you the skills that will get somebody to hire you for what you know the day you graduate. But it isn't going to give you a better career.

What will give you a better career is the wayfinding, is finding your passion, finding the things you're good at and that you love, and so allowing yourself in your time in college to explore a variety of things, even if that's interdisciplinary and you have no idea how they're going to go together.

Nobody knew what Google was or that a thing like Google could even exist when I was an undergraduate student. And yeah, that's a long time ago, but it's also not a very long time ago. So who knows how any of these things will go together in 10, or 15, or 20 years. And so for me those-- I wouldn't worry about what you could do with it. Worry about what you're going to do with some piece of it when you graduate, and you'll figure it out from there.

BRIAN ABRAHAMSON: But my advice would be, on that point, pick an intersection of things that you're passionate about. Get yourself started out that way. If you really love psychology or you really love music, you really love art-- one of our best developers is somebody with a history degree. Picked up software through some light scripting, this individual did, in a second job, and spent the next 10 years advancing that, and today is one of the top people we have.

About 30% of the staff in my organization, in the IT organization, don't have a technical degree. So to your point, it's not a perfect science. But I think if you stuck with what you really were passionate about, and whatever that intersection is, you'll make good use of it.

DEBBIE COMPEAU: And it turns out one of the best predictors of object-oriented coding ability is music. For whatever reason, OO coding and music go together. I don't know why, but they do.

All right, other questions.

AUDIENCE: Yeah, kind of on the same strain as that last question-- so you talk about combining business and technology, and understanding those two aspects together. What are some specific ways we can kind of jumpstart that? Because we kind of learn business in class, we learn technology in class, we do projects that deal with technology, or we look at business cases. How can we combine those together in college to prepare for a career?

BRIAN ABRAHAMSON: So I'll give you one idea. A lot of you, if not all of you will look at internship opportunities. I think those are incredibly important to get you some kind of real-world experience. You're going to find, in my experience, two types of internships-- those that bring you in as kind of an understudy of an individual, that you kind of just help them get their workload done, or just kind of task-oriented. You're going to find other types of internships that tend to be a little bit more experiential, meaning you might join, and you might be a member of a small team, and you might have a problem to solve.

I think the latter are much more powerful internship experiences. Because you're going to walk in, and instead of just learning to help somebody with their day-to-day tasks, you're going to be given a problem to solve, you might have a couple other people with you. And that is going to naturally lead you down the path of, OK, in the real world, I kind of got to figure out what's the problem I'm solving, how I'm going to do it, who are my stakeholders, how do I bridge some gaps, how do I bring clarity to what is we're trying to get done, how do we work with a small team to make that happen.

You get a whole bunch of skills. I think a lot more internships these days are actually going towards small projects and experience-based things. But I would look for that. I would screen who you're going to interview. I would ask questions about how they run their internship program, and what it looks like, and things like that.

That's one way. I think sometimes that's a hard thing to just pick up in a classroom. But when you think about the pre-employment internship things that you have the opportunity for, that's one thing I'd look for.

JOAN QAFOKU: Yeah, I would echo the internship point. I think that was, for me, the first opportunity to actually apply the things that I was learning, and actually see how that works in a real organization. I think it all felt very kind of up in the air and theoretical until I got to my first internship, until I had a very specific problem to solve, and until I actually saw how that impacted the company and how that was going to make things work more effectively. That whole picture got a lot clearer for me following my internship.

If you don't have the opportunity for an internship, if you're in a position where maybe you've missed some deadlines, or maybe you just want to do something differently and don't have an opportunity to intern, side projects or special projects are certainly a good way to get around that. Just pick something and do it. If you go to a store and buy Raspberry Pi, and then configure something on that device that is cool, and you can have that be your own side project, and you can talk about that in an interview, that itself, I think, would be a very cool kind of credentialing factor.

But an internship, there's really nothing that replaces that, in my opinion. Because that is a real business. You've been brought on. And if it's a well-structured internship program, it gives you personal accountability and personal responsibility over delivering a project, and a very real sense of responsibility around that. Because you're being paid, there are people that have expectations of you, and it just makes things a lot more real, I would say.

DEBBIE COMPEAU: I think the other thing you can do as a student is think about yourself as the point of integration. No question, the way our classes are structured are very functionally siloed, because that is often where the knowledge base comes from. It's an artifact of how we're structured as a business. But you're the point of integration between your classes. So when you spend time-- and I know you've been all of your time outside of class thinking about things in your class. But you do spend some time. Every once in a while, those ideas pop up. And before you can squash them down and say, stop thinking about that, you've thought about school.

When you think about school, think about how what you learned in marketing relates to what you learned that day in finance. You might find that there's questions that come up by thinking about how what you heard in hour 1 differs from what you learned in hour 2. And go ask somebody that question. I will tell you right now that if you showed up at any faculty member's office and said, hey, this happened in finance, and this happened in your class, can you help me put those together, we'd be overjoyed. We'd like that a whole lot better than you asking us the question that the answer is already in the syllabus.

So thinking about yourself as the intersection point, thinking about your class projects as ways of pulling together those intersection points. So if you happen to be really interested in finance

and information systems, there's a whole bunch of stuff you can do around fintech. And probably any project you could do in any class, there are some opportunities to start to pull those things together. So look very deliberately for opportunities to bring your class learnings together, because that is an important part of your learning in the program. You will also find, as you get to fourth year, you'll start to have more capstone experiences that will help you do that. But there's a lot that you can do yourselves.

One more question?

AUDIENCE: Hi. Thank you guys for being here, first. I'm a senior, graduating soon here, and looking for my first job, kind of in the tech-savvy business person kind of place. What are some things that you would recommend might be some steps that someone in my position could take that you'd recommend.

BRIAN ABRAHAMSON: I will tell you, I think, graduating when you are now, the field of opportunity is potentially broader than I know that I have seen it in the last 20-plus years. And so I'd give you a couple pieces of advice. One is to go broad with what you're considering. Don't pigeonhole yourself to, I need to work for this company or this exact type of job. You know what I mean? There's powerful things now, on LinkedIn and other kind of job boards, and through connections with WSU, and your careers office and whatnot, the school.

Entertain six or eight things. So I came out of Gonzaga. I went through 10 interviews, not because I had any interest in four or five of the companies. In fact, one of them was the US West Phone Company at the time. And I was like, God, no, I don't want to do this, right? But I had an advisor at the time that was like, push yourself beyond what you think you're interested in. Get some experiences. If nothing else, you're going to get better at interviewing. So pick a few that you know you don't want to do, so that as you sharpen up some interview skills, you're not doing it at the one that really matters. But the other thing is, you kind of learn a little bit more about yourself.

So don't go narrow. Go broad and go big. Interview a lot of times, a lot of places. Interviewing is a skill, by the way. You get better at it with time. You're never going to be great the first time. You're just not. And so practice makes perfect. Do a lot of that stuff. And you might discover stuff and stumble upon stuff along the way that you want to do.

The second piece of advice I'd give you-- and this is always harder with where you're at now. But if you have connections or networks, maybe other alumni, people that have graduated ahead of you-- think about your network. Who are these people that you know? Eight times out of 10, especially as you advance in your career, it's your network that places you, not the cold call, not the interview. I've never met you. Your network is so valuable. So start building that network now with those people that are already in the workforce that you know, with other relationships you might have, or other avenues.

JOAN QAFOKU: Yeah, I completely agree with that advice. I would say, as a new graduate, you are uniquely able to apply to positions at organizations that are open specifically for new graduates. Once you enter the industry, you are then an industry hire, and usually the level of scrutiny on industry hires is entirely different. Knowing that, you should apply for absolutely everything that is open. You should have no excuse for not applying for companies. Even just total wild moonshots that you have no idea if you'd actually get that job or not. You should apply for every single company that's available, every single job requisition you see that's open.

And as a senior in the Carson College of Business, you should leverage the opportunities that you have to get mentors. We have a mentorship program that I'm part of as the board here-- shameless plug to Nicole in the front for running the national board advisors for the IS program. But we would love to talk to students that are in your position that are seeking their first job, that are seeking what they'd like to do in the industry, and help you out in whatever way we can. That's why we're here.

So leverage those connections, apply for everything, don't sell yourself short. But yeah, this is the time to do that, and this is the time to kind of invest that time. And enjoy the last months or year you have of college. Because it's a wonderful time, and you'll definitely miss it when you graduate. So do all of those things collectively and I think you'll be happy with the result.

DEBBIE COMPEAU: I will say one thing about this. Because at one level what both Brian and Joan are saying sounds contradictory to what the Carson Center will tell you. The "apply for absolutely everything," the Carson Center will tell you not to be scattershot. They're actually not telling you to be scattershot. Remember, when you apply for absolutely everything, you have to do all the research on absolutely everything. Apply for everything doesn't mean just toss your resume randomly into stuff. That's what the Carson Center is telling you not to do. That's not what they're telling you to do. They're telling you to look widely and consider a wide range of interests. And if that means you apply for absolutely every job, great. Just throw yourself into it.

BRIAN ABRAHAMSON: Be prepared to sign up for the research.

DEBBIE COMPEAU: Do sign up for the research that goes with it, absolutely. Absolutely. All right, well I would like to thank Brian and Joan very much for coming and sharing their experiences with us today. So can we give them a round of applause.

[APPLAUSE]

BRIAN ABRAHAMSON: Great questions, by the way.

DEBBIE COMPEAU: And of course it wouldn't be a WSU event if we did not share a gift of cheese.

BRIAN ABRAHAMSON: Oh, fantastic. I tell you.

DEBBIE COMPEAU: And a bag that will get you into football games.

BRIAN ABRAHAMSON: Look at that, guys

DEBBIE COMPEAU: So thank you both very much for joining us.

BRIAN ABRAHAMSON: Thank you.

JOAN QAFOKU: Thank you.

DEBBIE COMPEAU: Thank you all for spending some of your Friday with us. It's been a pleasure. Have a great afternoon. Go Cougs.

JOAN QAFOKU: Thank you, guys. Take care, everybody.

[MUSIC PLAYING]