Detroit Mercy Cybersecurity 313 Podcast no.9 with Daniel Shoemaker

Tamara Shoemaker 00:00
Hello, this is Tara Shoemaker. And I'm the Director for the Center for Cyber Security and Intelligence Studies at the University of Detroit Mercy. And I had the privilege of interviewing today and talking with Dan Shoemaker, we are going to make any allusions to the fact that we don't know each other, we happen to be married to each other, but he is the director for the Information Assurance Cyber Security Master's Program. And I'm privileged to have him come on here and tell us a few things about his program and some of the past and some of the war stories, I suppose about some of the things that we've gone through over the years. And so I guess, to let's get us started off, Dan, your program has been ranked number one in the country for holistic programs. What exactly does that mean?

Dan Shoemaker 00:49
Well, it's it's a point of view, basically, the, in general, cybersecurity is pretty much considered to be an electronic discipline, which is, kind of reflects its origins. It was, you know, kind of, originally sort of a national security thing back in the late 80s, early 90s. And it sort of came up became a creature of the NSA, because, you know, kind of they were the ones that were handed the ball by Congress to implement cybersecurity, which was known as information security back then. The fact that the NSA was running it, and that the NSA, primary mission is signals intelligence, kind of determine what the focus of the kind of protection would be. And the centers of academic excellence, which we joined very early in the process, primarily required computer disciplines with a considerable emphasis on technology in order to be able to join the club over time, and back in that era, that was pretty appropriate sense, most of the kind of break ins or, you know, most of the harm was done through electronic means. But what's happened over the 16 years since we were part of joining the club, is that the technology? No, I mean, the problem has evolved. And, you know, with things like social engineering, and a lot of other things that were going on, that basically weren't identified at the time, the actual degree of harm from electronic means has been diminished to a point percentage wise, it's about 29% of the whole problem. The, the rest of the problem has been through physical and human centered attacks, social engineering, that sort of stuff, insider threat, and just simple theft, you know, that sort of thing. But anyway, long story short, about let's see, let's get this right. 29% of the problem is electronic 71% of the problem is human and physical. And we don't really actually cover that. And so what we're doing is producing people that are more or less watching one mouse hole, while the mice are coming and going through all the other ones that they're not watching. And so a movement started back in the late aughts, you know, 2009 2010, in that era, to kind of talk about the field in its completeness, in terms of the problem. And that's where the term holistic, started being used in all holistic means is that we consider every possible Avenue Attack, attack vector, if I can kind of use that term. And those methods of attack basically incorporate three different interfaces, physical interface, the human interface,

and the electronic interface. holistic security, basically looks at countermeasures for the human and, and the physical interface, as well as for the electronic interface. It's a much broader view of the field. Basically. We got into that very early simply because that's something that I believe in and also common sense Timing sort of dictates the, you know, kind of the the fact that you're not really secure if you're not actually secure. And so the movement itself has gained, you know, a lot of momentum. And I have to add that we're number one in the country on online programs, there are other programs that are not, that are more traditional. With amongst all programs, we're number 36. And, you know, essentially, that's kind of what the program is about is that the students try to look at this as a complete understanding of what's required, not just the stuff that we find interesting and entertaining ourselves. And that's what we try to deliver to them.

Tamara Shoemaker 04:33
So it looks like you're trying to put you're trying to make sure that the whole, the whole gamut of things are covered, Correct.

Dan Shoemaker 04:40
Yeah. But we're fully and completely protected. You know, it's kind of a false sense of security, to think that you're safe from any kind of, you know, information assault when you're not. And so, you know, the idea of personnel security in particular, you know, you spent a lot of money on the firewall, and you spent a lot of money on the system, and then you don't spend any time whatsoever vetting the people that run it. And, you know, it's that sort of thing that that businesses basically are looking at, I mean, the problem is really massive. On statistics, I know professors like these sorts of things, but 2015, on the cost, or what the lass two information type attacks was $500 billion, not million, trillion, I mean, but billion dollars, by the year 2018. That had gone up by power of four to $2 trillion. And the expectation is by 2021, it will be closer to $4 trillion. That's trillion. And, you know, to give you a little sense of perspective, the current lost information type attacks worldwide, is equal to the gross national product of England and France combined. So that it gives you some idea of of, you know, that's being taken out of our economic infrastructure. Oh, that ought to give you some idea of why we need to solve the problem.

Tamara Shoemaker 06:01
And then why you It's clearly something that keeps moving right, the target keeps moving, things keep changing. This is not something that can be static, and just done and one and done. Right. So that's clearly what's happened. So you alluded to earlier that you, the NSA basically started in, and we were, we're at a center of excellence, we have been since 2004. What's that all entail? And why is that important?

Dan Shoemaker 06:21
Well, it's really important, and back in 2004, because there was absolutely no agreement about what we ought to be teaching. There still isn't really, but back then nobody knew what to teach. And so, you know, if you wanted to start a program and information assurance, you're kind of stuck with making up whatever you thought you ought to do. Having an authority like the National Security Agency, which is worldwide,

and supported by the government, and generally commonly accepted as being an authority, tell you what to teach, as being correct, it was important, you know, a lot of the problem out there, in my opinion, not so humble opinion, is that people try to set up programs based on just what they know. And, you know, that's really irresponsible. Because basically, you don't know everything I don't. One thing I accepted early on was, I don't know anything. And so I'd much rather have people who have spent a lifetime trying to study the problem. As a group, tell me what to teach. And then I'm more than happy to teach it. And basically, that's the concept between behind the centers of excellence. There also were some other hoops you had to jump through that had to do with kind of national or with local dissemination of the word here. But the idea basically was that, you know, we'd be kind of points of excellence that could kind of influence everybody around us in kind of the doctrine that NSA was pushing at the time. those standards were national standards. They were set by the CNSS Center, National Security Standards Committee on national security standards. And you had to essentially map your program to those standards reset back in early 90s. And so, you know, it's about as close as you could get to come to agreement about what you got to do. And essentially, that's basically what we filed up to the point we're NSA kind of wandered off the reservation a few years ago and started making up their own. But bottom line basically is our aim as a program is to try to be as authoritative as possible in a field where there's just total chaos right now. And anybody who tells you that they know what the you know what it's all about. His doesn't know what it's all about, in my humble opinion, not so humble opinion.

Tamara Shoemaker 8:25
So you've sort of taken the programming you followed whatever the current standards are, and and map to those as well as the NSA standards, or I'm sorry, they don't actually call them standards, do they call them knowledge, skills and abilities? And that kind of thing?

Dan Shoemaker 8:39
Yeah, the KSAs.

Tamara Shoemaker 8:41
Yeah. So you, you have continued to do that. So we we still are a center of excellence, we have been since 2004, we keep every five years, we have to re get being evaluated and go through. So all those fiery hoops all over again. And we've done that successfully over and over again, we're due again this year. And so it's been something that we have continued to move and grow with, correct. So you, you know, it started out, you said that they were the only ones that were the authority figure at the first at first. And now there are other other players that have come in, and have put together standards and that kind of thing as well.

Dan Shoemaker 9:11
Well, it's funny, you know, it's a sort of a side story, but you want to war stories. Back in. Back in the late 80s, there was a struggle as people began to become aware that computerization was leading to kind of the, you know, sort of issues with with security.

There was a the standard, you know, wrestling match up on Capitol Hill about who got to run the show. And on the one hand, you had NIST, which was basically business if you want to be with that, but that way, but the standards body for the government, but it, you know, it tended to have stuff that was very much more business friendly. And then you had NSA, which was DOD(Department of Defense), you know, classification structures, and all that other sort of stuff. NSA literally won, and that means they got a big bag of cash to be the people that led everybody in, you know, kind of in, in developing information security. And this got put on the sidelines. And you kind of wonder what it would have been like, if this had been a winner, it would have been a lot more business oriented, a lot more business friendly, earlier on. But anyway, long story short, became pretty clear as it as it was out more and more obvious that we weren't getting the job done, because rather than reducing the number of breaches, it they were increasing logarithmically. You know, then NIST became became part of the picture again, that's the National Institute for Standards and Technology, nobody. NIST became part of the picture again, and what they did basically was develop a workforce framework in conjunction with the Office of Personnel Management, what they wanted to do was to kind of standardize the job classification structure for the federal government information security. That's the initial purpose of the nice framework, but national initiative for cybersecurity education nice, has a really massive set of knowledge, skills and abilities, broken down by various areas, eight of them, that are essentially, you know, kind of large buckets that they put all of this stuff you need to know and, and it's much broader obviously, in fact, all those eight only the first three are have anything to do with computers. The rest of it has something else. Securely provision is. You know, basically programming software. Operating maintain is basically anything has to do with working, operating the computer and protect and defend is network security. Everything else is something else. You got basically criminal investigation, forensics, you've got two intelligence areas, which are really nothing more than just intelligence and you got one that is related to kind of all the managerial things like legal compliance and that sort of stuff. Risk Management. Long story short, it's a much different view of what you need to know in order to be a professional. Then the NSA standards, which are very narrow and electronic. Nobody has said this one wins over this one, what they've done instead is the NSA has claimed that they map to parts of nice, which I don't know whether that cuts any ice. But the bottom line basically is if you're trying to kind of cover the whole problem, you really are sort of stuck with nice is the solution. And so yeah, we kind of the program that we have is been much more oriented towards what's in the nice framework than it is towards the NSA. But we do the NSA stuff, and can do the NSA stuff, because they're a subset. And so we get the legitimacy of being a longstanding Center of Excellence, along with, you know, kind of the personal satisfaction of knowing we're teaching the right stuff.

Tamara Shoemaker 12:26
So a little bit about your program. So you've got the background. So you started out, you know, putting it together with the NSA, and then you incorporated then the NIST workforce framework and any any other standards that are out there. I mean, I also know that you have the CSEC. 17 2017. Is that what it's called? It's also involved in this.

Dan Shoemaker 12:43
CSEC 2017 is a isn't is actually the authoritative effort. It's a I think you can tell that there's been a whole lot of pushing in this

Tamara Shoemaker 16:25
Discipline hasn't always it hasn't been defined. It's new discipline. And so it's had growing pains and along with it, we've grown our program has grown and changed and morphed as well. Right? And so you've incorporated all of those things into what the program looks like today, correct?

Dan Shoemaker 12:50
Well, yeah, I mean, it's all we're saying it to call it a discipline, discipline, you know, what you're teaching, you know, you're in the math department, you know, what you teach English, same thing. cybersecurity, it's anybody's guess. And we're all kind of arguing that it's like the, you know, world religion. And so you got the monk, you know, Muslims over here, you got Christians over here, you got the Jews over here, you got, you know, that sort of stuff. So nobody agrees. That's a lot of the problem. And, you know, that works, okay, I suppose in world religion, but it doesn't work very well, when you're trying to provide the best possible education of people. And so what you end up doing basically is looking to see, stabilize the content of the field, I as you can tell, I'm, as you know, 1000 years old, and I literally came up during an era when there was no such thing as computer science. It was basically the math department, believe it or not philosophy, because that was Boolean algebra. And, you know, electronical, electronic educate, electronic edge. Okay, electrical engineering. You know, it didn't come together as a field until after I graduated a long time after I graduated. Now, people talk about computer science, like it's always been there, and everybody knows what it is, which is true. But you're talking about the 1960s. You know, when all that was happening, and we're in the same boat right now, there's a lot of pushing and shoving and disagreement going on. But the bottom line basically, is we got to get something somewhere where this field becomes an actual discipline where everybody knows what it is what his teaching was producing. Nobody has a slightest idea what you're getting when you're getting somebody's cybersecurity degree, most cases and network security nerd. Now, you know, the people that have always defined standards for academia have been the society's IEEE, ACM, AIS. I triple E does software engineering. ACM does computer science and AIS does business information systems. They have tended to get together when they feel like somebody needs to actually define a field. They did last time in 2005, because there were million computer disciplines out there and nobody really knew what they were on the computer, CS 2005 basically nailed that down five disciplines. The CSAC is the next incarnation. And what they're trying to do is to get control of the field of cybersecurity. So at least us academics have got some agreement. That's what the C SEC is talking about. It's very similar in structure to NICE in that it's got areas other than electronics, tech, it has one entire area devoted to ethics, which is useful in this day and age where there's no such thing as ethics in computing. So, any rate basically, we're still looking at that standard in terms of how we're going to incorporate it but you know, it gives us a pretty clear path and things to talk about. about things like why data data warehousing may not be the best idea in the world.

Tamara Shoemaker 15:51
So you know, always trying to stay on the leading edge, always trying to stay with whatever is the standard, that kind of thing. One of the things that you did start so we're in the midst of a Coronavirus, and industry is now having to work from home. Education is been turned on its head and is now sort of up in the air as to how we're going to do it, if we're going to do it virtually, or in person and all that kind of good stuff. So was it five or six years ago, I'm not sure.

Dan Shoemaker 16:33
But you went all online with this program Six years ago, 2014, we went all online, it was pretty obvious that we were I mean, UDM service areas, how far you can drive, maybe 20 miles maximum, it became obvious that if we want to reach the whole wide world, we're going to have to go online to do on our program, because it's holistic looks at things in a kind of big picture sense. And we're graduate. If you're a community college, you probably can't do it online, like we have. But because we're a graduate program, we do on the higher concepts, and you know, how it all fits together at the top, because they're really training leaders, not network nerds. And so, you know, we went online, it was highly successful. From the beginning, as in all we did was take our information assurance curriculum, and, and kind of put it out there that way. But the advantage is that when the pandemic hit back in March, we didn't miss a beat back, they, they closed the school for a week, and I had to send out an email said, they may be closed, but we're still open for business. So come on down, and we didn't miss a beat. What's happened now is that people who are desperately looking for, you know, to go back to school, but don't want to die doing it, have been beating down our door, trying to get into the program, which has created the problem that we don't have room in the program for everybody. But I mean, the bottom line basically is that we can deliver what amounts to a highly rated and if you consider number one in the country program of education, without exposure to the virus, the actual outcomes I've gotten from this have been kind of hard on me, because, you know, you have a certain concept of how people perform. I've been teaching since 68.

Tamara Shoemaker 17:59
And you get a, you know, you know, pretty much yesterday, I don't know what you're complaining about

Dan Shoemaker 18:03
That was just yesterday, just yesterday, and I'm just a young man. But you know, the idea basically, is that you get an idea of how people are going to you can expect people to do in any given class. Um, when we went online, and because of some features we have, we basically enhance the learning to a point where it blew up the curve. And so, you know, I get my first exam, you have my first set of classes online, and all of a sudden, I'm trying to give everybody everybody in the class A's because based on the performance of prior classes, that's where they fall. And you know, so I start thinking to myself, as this changed something, and you know, you start looking at your own gradebook, and what you're discovering is that the class used to be that was living in a

classroom used to be about here, performance wise, and now it's about here. And the only thing that's changed, is this gone online. We do, the thing of the advantage that online has, at least the students have communicated to me is the recording. Everything we do is it's on zoom now, but it was on more ancient technologies back in, in the beginning six years ago. But everything we do is recorded. So all of my lectures are recorded. Now. You know, I've gone in there at night, lectured a bunch of people worked all day, you can see him dozing off. As I'm talking, I talked droning on for two hours, and then I go home. And some of them wake up and leave with me and the rest of just sit there with his bag. Um, what do they get that lecture is it or as I put the same two hours up with me talking like I'm doing right now, and they can stop and have a beer go, I can't stand this guy, and then go back to listening to me. And so I move the content the way I want to be able to move it. And they can do it over not over two hours, but they can do it over a week, after you know when they're feeling you know, a little bit less stressed about work and so on and so on. So yeah, they learn a lot more. We have a synchronous sessions, which are basically me once a week. without a script. I don't have any I'm not pushing content. That's all in the lectures and You know, we talked about it, most the time, they just sit there like, like, you know, sheep, but and I talked but the bottom line basically is that it's give and take. There's no scripting, I just talked about stuff, they get to answer ask me questions. And I try to normally what I end up doing is trying to explain the lecture from that week. But that sort of stuff, they post stuff, they've never done that before. But now they got a discussion board where they post stuff, and I make them do it, of course, or they don't get a grade. And, you know, they do live online labs with me where I walk them through stuff, face to face. And again, we're not doing chemistry experiments, what we're doing is stuff like trying to formulate, you know, a cybersecurity system, you know, of, you know, of cybersecurity countermeasures. And I can do that, you know, kind of in the abstract, and that sort of thing. And so long story short, they get a much richer experience a lot more of an opportunity to kind of interact with me. Because, you know, like I said, for an hour, there's a captive audience for an hour, they can chat with me, they can talk to me directly. But the bottom line basically, is that there's a lot more interaction, actually, even though it's virtual. And so that's the system. And I think that's the reason why we've done so much better in terms of our own education delivery.

Tamara Shoemaker 21:10
So if I understand correctly, so they get the, they get the actual lecture ahead of time, and they can look at it at their leisure. And so instead of sitting in a classroom, like you said, and taking copious notes with their head down, and just focusing on that, they get to take it in as they as they need to take the notes that they need to do, do whatever, during the week. And then once a week, you meet for an hour then and they have an opportunity to now ask you if they had any questions about that lecture, ask you how your day was or talk about whatever, but you guys get done that one to one time and that time, quality time, sort of go over what you what they needed to know, in that one hour period. And then that lasted the whole the whole time. But they also have you they have group group work that they do together so that they are working as a team, just like in real world. And they are doing like you said, the group chats and places where they're interacting with each other, and that kind of stuff. So this is not so so many

people think of online, as you're all alone. And the only, you know, the only time you talk to a professor is when you send them an email. And you know, it's your own pace, and you just kind of struggle through it. And there's no actual instruction. And that's not at all how you guys have set this up?

Dan Shoemaker 22:12
No, I look at the chat that's going on between the students and it's stuff like, um, he looks like he needs a haircut, you know, and that sort of stuff. Um, so I mean, they can, you know, I think they're basically they can talk in class and not not have a teacher, you know, there's something I forgot to mention, by the way, the main evaluation artifact, and this is a what I consider to be a professional project. Most cases, it's a plan on the cyber law class, it's more of a brief, but I mean, the bottom line basically, is they have a requirement to work in a virtual group, which I assign its virtual teaming in the professional sense, in that they interact around and we have students as far away as Germany, we have a lot of people in the military, you know, who are not here, who are part of these group projects, and basically they interact from where they're at, there has been some issues about time delay, you know, because the guys in Germany are five hours, six hours ahead of the people in, in the US, but they better get used to it. Because that's the way the world works. Now, you know, pandemic, no pandemic, before a long time before COVID came along, everybody virtual team, because nobody wants to fly to Japan at a meeting. And you know, it's a globalized economy now. And so they gotta learn how to work in the groups in virtual groups. That's the core evaluation, artifact and all of our courses. And, you know, you can only do that online, somehow the idea of, you know, them all sitting around their little desk, while they all talk, just just close to what's going on in industry, when we're trying to duplicate the industrial experience, not, not the same experience they had when they were in the third grade.

Tamara Shoemaker 23:41
And they're putting together a report just as if they would for their own VP of, you know, information assurance and that kind of thing. So they're putting together game plans and policy and procedure type things and things at a higher level, and then presenting correct and you obviously are then evaluating how well they did.

Dan Shoemaker 23:10
Yeah, I tell them, I'm their son of a gun boss, you know, and…

Tamara Shoemaker 23:15
I think that pointy headed bosses.

Dan Shoemaker 23:50
Yeah, no, no, I'm the guy who was a, I don't know what I can use the word without getting bleeped out. And, you know, that kind of boss. Um, and therefore I'm looking for you know, I'm looking for people to weed out. So, you know, when I get that report, I want that report to tell me what I need to know and to do it in chapter and verse and in detail.

Tamara Shoemaker 23:59
So that they all I mean you so you're there working in teams that one of the other things I think that I remembered sort of hearing overhearing sometimes over dinner discussions was that they sometimes have the ability, there's sometimes we'll have teammates who are sort of just along for the ride, not really showing up for the meetings aren't really getting involved in it, that sometimes there's a group discussion about, maybe this person should be fired and those kind of things. So there really is their own trial by fire, just like it would be in industry,

Dan Shoemaker 24:58
Right, I get, I get the same all the same grade. So whatever the thing gets, they all get, gives them that sense of you know, they don't do what you're going to a and you get a B and you get a C, in the real world, what they do is say your team either succeed or fail, and that's basically half of them, they get the same grade, if they got a slacker, they may even choose to bring him along, I gave him that big lecture about this guy's loser don't do that, you know, but they do it once in a while. But more often than they'll say, you know, Joe Blow didn't participate. So he's fired. You know, I have plenty of people that want in the program.

Tamara Shoemaker 25:21
And they've got the usual and they've got their lab and posting stuff, they get one of too, it's not also the only thing that you grade on, right? I mean, there are there's also midterms and finals and assignments and other things on top of that as well correct that you use to determine what a person's grade is?

Dan Shoemaker 25:24
Oh, sure. They've got, you know, the usual exams. And they've got the usual and they've got their lab and posting stuff, they get.

Tamara Shoemaker 25:30
One of the other things that's so one of the other positive things. So Center of Excellence positive online, all online positive, you never have to step foot on on campus. And then the other thing, I think that it was kind of an important piece is this lockstep piece, right. So that there's, I think what I understood you, you can, if you went full time year round, you could actually finish this degree in a year. Correct? And can you explain what that means by lockstep?

Dan Shoemaker 25:50
Yeah, sure. I have, I'll tell you Firstly, what the motive is, basically, we're not training entry level people. While we're getting And I might add, what we're getting are people who, in some cases actually have the title CISO (Chief Information Security Officer). And there are several actually currently that are students who are trying to basically get the best education they can get in so the idea is that we're trying to attract a type of student who's maybe not traditionally the sort of grad student who basically was an undergrad, and now he's a grad and will be a grad until, you know, his parents kicked

him out of their basement. While we have our, you know, full time employed, I have a very high preference for veterans, you know, professional people. And they got to know what's going on, because they this isn't, you know, they got wife, kids, job, all that stuff. It's not like they're kind of hanging around waiting to see when class is going to be scheduled. And so the program is built around a very rigid structure that we maintain, that's lockstep, we maintain year after year, after a year, and we publish it in advance, anytime they ask for it, we send them the material, but the bottom line basically is they know what class appears when it appears. And they can schedule accordingly. You know, if they can't handle because their work is what it is, they can't handle, you know, the full load, which is three classes a semester, they can choose the ones they want to take, and knowing I'll be able to take this the rest of them The following year, all it means is they don't graduate, you know, some a few of them. And usually the ones that aren't actually way up the ladder will do in a year, in summer, just that good that they can do it in a year. But the you know, the idea basically is that that means there, they have three classes a semester, in the fall, three classes in the winter. two classes in the spring half term, we have to half terms in the summer of seven weeks, to in the in the spring into in the summer. And because they're completing in one year they walk you know, in the graduation ceremony that's actually after the second semester. But the bottom line basically is they get to put on like, you know, that cap and gown and in nine months after they start.

Tamara Shoemaker 27:52
So some of the things that make you guys different right so are Are the fact that you, you have it, it's all online. It's lockstep you're an NSA center, you're ranked number one in the country online.

Dan Shoemaker 28:03
Number 36. When you put us up against places like Carnegie Mellon, and, you know, Georgia Tech and places like that, I was very, very pleased by that. The whole program as a whole, if you don't consider it from an online standpoint, basically, just in terms of the curriculum, you know, we're right up there with University of Southern California is number one.

Tamara Shoemaker 28:13
In for a small, private, oh, we're way ahead of me on liver noise and six in the middle of the heart of Detroit. I think that's a pretty darn good record.

Dan Shoemaker 28:17
Yeah, you know, I graduate graduated from Michigan. And yes, we are snobs. And so you know, things like, academic reputation in the community as a whole area. Now, you know, the community as a whole is important to me. And so yeah, the fact that we've got that reputation is very important. And it's something that students are, you know, looking to get themselves, you know, hired when they get out how to keep in mind as well.

Tamara Shoemaker 28:22

I mean, I think that's why you're having a global following, that I probably on top of the fact that you are a published author in this area. We do we talk not talk this morning, a little bit about the fact that you know, this is your 11th, no 12th book, no 11th book that just came out this spring. So I mean, some of the things that other things that so so you you're online, you're an NSA, you're, you know, you lockstep all that kind of good stuff. Some of the other things that you talked about briefly earlier about, we're not exactly our traditional one would think of as computer science or or engineering program, we are a holistic program. And because of that you teach things like a cyber law, and you teach social engineering. And one of the other things that I think is really important that you teach, and I think that many of the folks are surprised that you teach is you teach SCRM (Supply Chain Risk Management). And, and you teach ICT SCRM ? And can you explain a little bit about what that is? I know that, you know, that's a topic that's really hot in the government right now. And I think industry is industry as well. And so maybe you could explain that a little bit. And how you do that?

Dan Shoemaker 29:08
Well, I hate to break news to anybody, but we don't make consumer software any more, at least not in this country, we integrate it, you know, the software tends to get written where you can pay the programmer 10 cents on the dollar. And that means India or you know, other kind of countries that where people are willing to work cheap. The and so most of our software is purchased. I haven't written a word processing program ever. But I use one. And you know, the thing that we're using right now to talk to each other, we bought this, we didn't programming ourselves. And, you know, there's probably original programming going on somewhere, maybe in Redmond, Washington. But the bottom line basically is that the actual programming work is done in places where it's cheap, and still very good. You know, in some cases, India might be better than us in that particular area. But we integrate stuff. As it kind of moves up a supply chain exactly like the supply chain you have if you're making a car, from bottom to top, on into products. The only problem we have is that it's software. And so the problem with software is you don't know what you're buying, you can't see it and eat those. Even if you speak the language, you can't really tell what it is, if you want to read 10 million lines of code, you can't really tell what it is. Because the suppliers don't give you the source code they give you which is you know what you could read, they give it to you in binary, because they don't want you reading it. They because they'd be giving away their product. Long story short, is completely invisible, highly dynamic product, that you're basically buying a pig in a poke. And so they have this thing called cots, commercial off the shelf software, which is the industry. And when you talk about all the money and we talk about software business or stuff where you're talking about basically is buying bits of software integrated into some kind of product and giving it to people. If you've got this supply chain bottom to top you've got all kinds of vulnerability at the bottom of the supply chain because most people don't know what the what's going on down there. You know, you may have a supplier and the supplier may have a couple of subcontractors. But beyond that you have the customer don't have any idea what you're buying. And so when Chinese malware started turning up in weapon systems The US military was buying back in 2010. Congress went, yeah, off the deep end, dragged the Secretary of Defense down to kind of justify why in the heck, we were buying Chinese

malware. And he explained that they didn't have such idea what they buy or buying, because they didn't know where it was coming from or what it was. That's the situation. And we don't be if I want to kind of get your conspiracy, you know, thing going, we still don't know what is what I'm looking at right now, in terms of you and me might be also being viewed by I can't think of the name of the president China, but you get what I mean. And there's no way you would know that. There's no way you know anything about the stuff you've got. All of its automated, all of its, you know, computerized all of its program, and everything in it is put there by somebody else. So supply chain risk management for ICT is different than supply chain risk management for, say, the automobile industry, in the sense that you're moving invisible products from person to person, and you got to trust the guy below you. Do you trust the Chinese? I don't know. I don't. But are they doing a lot of our programming? Who knows?

Tamara Shoemaker 32:17
Probably, oh, we're stuck with the thing where I mean, you know, for most people, they they put out bids, and the lowest bid is the thing that wins whatever contract that we've got out there, right. And so we're stuck with and then what does that leave us? And you know, and how do we know what we do have what we don't have. And that's part of what supply chain risk management is all about, right?

Dan Shoemaker 32:30
Controlling that process, you buy functionalities and moves up the ladder. And the only way you can do that is some kind of top down process. You're not gonna do it on inspections, because you're simply not going I don't even know who's doing it. But you can force down a process that says, from level to level that says, here's a certain number of things you have to be able to do know do improve when you write the contract. And contracts basically drive supply chains. Most of what's going on in the software industry right now has more to do with lawyers than it does with programmers. Because basically, the lawyers are the ones that determine what's how contracts are written and how contracts are enforced. And so if I got a contract with a subcontractor, I'm going to say that subcontractor, here's 10 principles, which are basically what we teach in the supply chain risk management class, you got to kind of write into your contract that does stuff like, you know, ability to prove the provenance of an item, you know, where it came from, and, you know, ability to basically do basic inspections and tests that prove that it's not an ability to document that and all that sort of stuff that basically teaches a process. And then we say to them, if you're going to source it down, or outsourcing, you make sure your people do the same thing. And then you make sure those people do the same thing. And so basically, what you're doing is imposing a kind of a security protocol on everybody up and down the supply chain. And you don't need to worry after that, because basically, if you're doing what they're supposed to be doing in terms of security protocol, you're safe. Now, people can still mess with you. But you know, that's about as much due diligence as you can get, because otherwise, you just got to pray that the folks in who are doing the programming and you know, the whatever the Chinese military unit programs, malware aren't gonna not put something in this can be particularly nasty. And so like I said, supply chain risk management is number one vulnerability in the world right now. Supply Chain risk, ICT supply chain risk is the

number one vulnerability and will right now that we don't know about and are happily going along. You know, like sheep with a kind of, you know, we trust you, we love you. And by the way, we're making a lot of money off you until somebody pushes the button. sounds sort of like something Dr. Evil would,

Tamara Shoemaker 34:47
Yeah. All you need is a cat Dan sitting on your lap, and we'll be all set. Are there any other things that we haven't covered that you when a prospective student calls and asks about your program? That are some of those sort of hot buttons that they asked about that? Maybe we haven't covered? Or did we do you think we covered everything that prospective student coming in here? And inquiring about your grad program needs to know?

Dan Shoemaker 35:10
Well, I think that, you know, they tend to be interested in kind of how they're going to interact with me. And so a lot of what happens basically is kind of reassuring them that you're available anytime. It's another advantage of the program. They want to talk to me back in like traditional classroom days, they could wait until next week, you know, office hours, I might show up I might find not show up, they may not show up, you know. But the bottom line now is that because this is virtual, they can contact me anytime they want by email. And I try to get back to them as fast as possible. But, you know, any information I provide, I try to provide it, like for instance, class starts next week, I've already sent them everything they know, they got the syllabus, they even have the lectures, all that other sort of thing in advance. And, you know, it's that sort of very personal touch, because what you get, because you're doing you know, kind of you to them, not you to the class, is that sense of each one of them has a sense that you're kind of immediately their body. And it's been kind of nice, because you do get buddies out of it from people, you know, they're quite nice, too.

Tamara Shoemaker 36:17
Yeah, last week, I posted on LinkedIn, when your your latest book was released. And I have to tell you that I was quite impressed with all of the students alone that have come back and not a one of them to talk to you referred to you as their professor or their instructor, every single one of them referred to you as their mentor. And, and so I think that that's one of the things I think the myth of this whole virtual piece and online is that it can't be, you don't have that sense of connection. And, and that and I think that it really, really matters. And, and I know that that's one of the things that you grade them on is their interaction with their, with their peers, and their classmates, their interaction with you. And then obviously, your interaction. And I gotta tell you, as your wife, sometimes I'm wondering why you're checking your emails, you know, at 10 o'clock at night, just before you go to bed.

Dan Shoemaker 36:59
It's a sickness.

Tamara Shoemaker 37:00

But you're real on it. And then the point is, is that you are just that, you know, an email away, and you definitely are there to answer their questions. And so while I get frustrated, as a wife, I'm proud as the center director, that that's something that you do. You don't

Dan Shoemaker 37:50
you don't get in the teaching game, if you're not committed. You know, I mean, I'm teacher, that's all I am. And, you know, if you're a teacher, you want to move people along. That's sort of what you're committed to. It's there, there's a quote by Walt Whitman, that I literally have chiseled in my brain. I'm a trainer of athletes, he shows a broader chest, and mine proves my art. And that's sort of been my motto for my entire career. So watching somebody do better than me, that's great. You know, I've got plenty of people done that. I don't know, that's mentoring or not, but it's maybe it's just sort of me being a fan. But you know, a lot of them have been, like, my own kids, you know. And I think that's sort of the mindset you got to have if you're in the teaching game.

Tamara Shoemaker 37:59
I thank you for taking the time out this morning.