A Transcript of the talk…

The Evolution of a New UX Design Resolution

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Pull back to an organization level, working to connect applications and other services together.

Jared Spool

As we celebrate this last UI conference, people have been asking me if this is really the last conference, it is so really the last conference. The big reason is is that we started this thing 23 years ago and the UX world was very different 23 years ago. In fact, we didn't call it the UX world, we called it the UI world. We have been calling it UI forever, the world has moved on and I'll talk about this a little bit more in a minute but the ... We are excited, this conference takes 18 months to put together and we've been doing two of them a year; the UX Immersion Event and this one, one in the spring and one in the fall. And so that's a lot of resources that we were using to make this event and I think we've done a fantastic job and the team has done great but we have so many ideas of things we want to do better.

And we've decided that by taking this event and retiring it, letting it go and live a luxurious life in the Caymans or some place. We would then be able to do some of these other awesome projects that we just don't get to do and so I'm really excited about those projects and it's been really fun. We had a saying for this conference, for 23 years we've had the same saying, which is we're going to keep doing it till we get it right and this one has pretty much gone almost perfect. I'm going to say that knowing that there's still one more day that that could not come true but it has been a fantastic ride. I'm going to get a little weepy. For those of you who are coming tomorrow, there are three workshops. Sid [Harrow 00:02:05] is giving is giving a brilliant workshop on grower research.

Nathan is going to fill up your brain on everything to do with design systems, you will come out completely componentized and Dana Chisnell and I are going to do a workshop on designing for [delight 00:02:27]. That workshop happens to be sold and there is a waiting list; however, if you are thinking about switching workshops, particularly if you are thinking about switching out of that workshop into Nathan or Sid's, which is there is still room, that's perfectly fine but we have a huge favor to ask you, which is after the session, go see Dana at the front desk. Also if for some reason you can't attend tomorrow, you've been planning to but you can't attend, go see Dana, let her know because we have a waiting list for tomorrow's workshop and we'll let people know through Slack.

So if you're not on the Slack the instructions on how to get on the Slack are on the tent cards on the table and we'll let people know if they get into the waiting list as soon as people tell us that

they're not coming to that workshop, we'll let people in. We have a handful of people on the waiting list so that's a possibility so please do that. And yeah, I think that's all the things I wanted to say. Okay, so I want to talk about something that sort of came on to our radar, actually I know the exact moment it came on to our radar, it was January 13th at 8:08 in the morning, Hawaii time. And that was the moment when the 1.4 residents and visitors in Hawaii were rattles to their cages with an alert that told them that they should seek immediate shelter and that this is not a drill.

And the moment that I'd heard that this had happened and then 30 or 40 moments, minutes later when it turned out there was not a ballistic missile heading 38 minutes later when the governor sent out a message saying that there was not a ballistic missile heading towards Hawaii, I was immediately interested in what was going on. For years, when we're not running conferences, the work that we did on the UIE side, we have a Center Center in UIE and in the UIE side, a bunch of the work that we've done over the years is what we call user experience forensics. People call us up in a variety of things often resulting in court cases, we've done court cases in everything from fraud to the death of a six year old in a fire because of a UX issue. We've had a lot of expert witness work and so we've developed this whole practice that has to do with forensics.

And so I pretty much knew that there was a good chance that we'd called on by somebody to talk about Hawaii so we started paying attention to what just happened, why did this message go out to 1.4 million people? So the question that came up, of course, was why. And why in this instance is really a shortcut for what is in fact the root cause. Now one of the techniques that a lot of people talk about in the UX field for getting to the root cause of something is known as the five why's. And the five why's is this process where you basically act like a four year old and you just keep asking why until people stop talking to you. And it's not a technique that we use in doing the forensic work that we do, primarily because it only takes you down one path. It doesn't open up the whole world of opportunities.

Once you get the answer to the first why and you ask the second question, you're sort of assuming that first why was the only why, that there was only one and it turns out that that's rarely the case. So instead we tend to use a technique known as the fishbone analysis. And a fishbone analysis is called such because it looks at a problem and it looks at all the possible root causes and when you draw out the root causes, they sort of look like the spines on a fish and so thus the name the fishbone analysis. And that's what we are interested in. Now within minutes of the alert coming out, not only did we kick into action in terms of trying to figure this out but we started to do research and discover that this was a call to arms for what we affectionately refer to as design Twitter. And design Twitter had lots of theories as to what had happened.

Within about an hour or so, someone had published this screenshot claiming that this was what, this was a newspaper, and they claimed that this was the screen that was at the Hawaii alert point that issued the message and this was the screen they were warning on. And the

immediate critique was, "Oh my God, that's a horrible, horrible menu who could make such a horrible menu, that's awful." And so design Twitter immediately went onto critique the evilness of anybody who would do this, and of course, any designer who did this should not only be disbarred but probably hung by their feet somewhere. But then another image came out from the governor's office, the governor's office said, "No, whatever you're seeing on the Twitter, that's the wrong image. This is the right image." And everyone went, "Oh, okay, that's much better."

Which it isn't really, but these are both actually the actual screens. You can see what this is, there's the actual message. If we look here, you can sort of see there's one that says PACOM (CDW) - STATE ONLY and DRILL - PACOM (CDW) - STATE ONLY, and the claim at the time was at that first PACOM (CDW) - STATE ONLY was the one that had been pressed. PACOM stands for Pacific Command. It's the US joint command that actually tells the folks in Hawaii that a missile's coming at them and CDW stands for a Civil Defense Warning. And so they were assuming that this is what had happened. And it turns out that this menu is just what happens when you see a list of files, and this menu is what happens when that list is put in some sort of categorization scheme of folders, but they're basically the same thing.

But within moments, we had this analysis and the analysis taught us that first, there must have been poor menu design and then there was a lot of discussion about, well, obviously there was no password because if there was a password that would have stopped people because no one just automatically types their password and then sends a message to have 1.4 million people so that must have been it. And obviously there was no confirmation message because wouldn't you want a confirmation message that says 'you're about to wake up 1.4 million people with a missile alert, do you mean to do that'. And then there was this theory that there was a whole bunch of people who were from mostly dev side of the world saying, "Why would you even combine the test messages with the real messages? Anybody who does QA knows that you have a test sandbox and you want to keep this separate and you don't want to put it together." And this was mostly sort of misinformed stuff. There's another one which was, there's no procedure for canceling. Design Twitter was like, "There should be a procedure for canceling!" I'm like, "You don't know how physics works." Once you you send radio waves out, you can't call them back. So there was all these theories, not all of which we pretty much knew at the time, didn't make sense, the separate test mode thing is absolutely the wrong thing for an emergency drill. It was pretty clear from the very beginning that what had happened was this was a drill that had gone wrong. The timing was not insignificant. It was 8:08 in the morning. The way these emergency operation centers work is that they have eight hour shifts, so one starts at eight and the next one starts at four and the next one starts at, whatever, eight hours from that is, at midnight.

So they just have shifts, and it was pretty clear that this was right at a shift change. And one of the things that design Twitter didn't know, but we happened to know from previous work we've done is that one of the things you do in an emergency operation center after a shift change is you do your drills. Because you've got new people coming on the job and their job is to actually

practice what they're going to do in an emergency. This is the reason that you have fire drills. In a fire drill, you're supposed to practice what you do. You don't go into a fake building to have your fire drill. You do the fire drill in the real building because you want to actually in an emergency, not think about it. You want to know what the steps are. So an emergency operations team does frequent drills and it's not unusual for them to do a drill right at a shift change.

So we were pretty sure this was a drill that had gone wrong, that they had meant to just do a drill and they didn't. And that's what the thinking was. Well design Twitter kept it up, a professor in Minnesota published that he had figured out that this was the system that the Hawaii folks were using, their emergency access system interface, and he was sort of critiquing it, "Oh my gosh, this is an ugly system from the 90s." This is government work and in government, the 90s is considered current. So this is not necessarily wrong except it was wrong sort of, the company was right. If you notice it says My State USA, but that company was acquired by another company called AlertSense and this was in fact the interface that they were using is the AlertSense interface.

And if you know anything about the AlertSense interface, it does require a password to use and it does have a confirmation message. No, it does not have a way to cancel the message because physics. And so that's what happens. And so we pretty much, once we established that they were using AlertSense, it was pretty clear what had happened. If you look real close at the screens, they are basically two versions. One is a mode when you ask AlertSense to just show you all of the files that you have that contain what are called templates. And we know they're called templates because if you look real close, you can see the bottom of the word template here, and templates are what these messages are stored in. The idea being that you create a template of what you want the message to be and then on the day of the emergency, you just fill in the specifics.

Now, most of the time the emergency management system is used to send out things like amber alerts and in the case of Hawaii, tsunami warnings, and they have templates for those things on the screen and you can see them. The missile alert drill was actually a new thing that was added just recently and that was the thing and what we thought, our sort of initial take this about 48 hours in was this was actually a classic UX problem, one that we have seen a thousand times in the 30 years that we've been around, and what this was was a file naming problem. How often is it that you opened the wrong file thinking you have the right one, how many times in your career have you overwritten a newer version of something with an older version of something because you didn't realize the file names had changed.

This happens all the time and we have never solved this problem and nor has anyone else, and as a result, it's a problem when it comes to sending out emergency alerts. You have a bunch of file names of templates and if you accidentally open the wrong one thinking it's a drill file but it isn't, that was it. So that was our theory was that we were sort of at this wrong file template type thing. But within a couple of days we'd found out that we were wrong. We were wrong because

the person who opened that file and sent that message didn't think it was a drill. It was a drill, but he didn't think it was a drill. What had happened was the shift operator had come on, the new shift operator, come on, started up their process. The supervisor from the previous shift having worked for midnight to 8AM, decided that this day of all days was a good day to run an unusual drill.

Went into a conference room nearby called the Emergency Operation Center on the phone line that's reserved for Pacific Command, started the conversation saying, "This is an exercise." Repeated it three times. This is an exercise, this is an exercise, this is an exercise. And then whoever had picked it up decided that was the moment they would put it on speakerphone for the entire operation center to hear, which is the standard procedure for this type of message. But he didn't repeat that it was an exercise when it was on speakerphone. He then went through the procedure for what would be a procedure if there had been a nuclear missile attack and that procedure has the words in it, 'this is not a drill' which he sat out loud. The poor employee hearing that believed it was not a drill, guess why?

And unfortunately then sent out a message to one 1.4 million people. Unfortunately, that was the employee who eventually got fired, not the supervisor who ran the unscheduled unpermitted drill. So okay, that put us in a different place and now we say, okay, user didn't understand that it was a drill and we thought that was it. But the questions kept coming in, particularly around the employee getting fired. And finally I had someone reach out to us, a guy named Martin Cast, he's a writer for NPR and he started asking questions. He said, "I'd like to interview you about this," and I'd already done a bunch of interviews on it so I sort of expected him to give me the standard set of questions but he didn't. He was fascinated by the fact that AlertSense is written by a company, not the government.

He wanted to understand why wouldn't the government write this software. Now I had just come off of spending a year in the digital service and I had a lot of reasons why we didn't want the government to write this software, but he wasn't buying any of that. He was very much interested in why was it that the government wasn't writing the software. And he had told me that the next day, he was going to talk to the person at FEMA who's in charge of the emergency management system, the head engineer there, to sort of understand why the government is taking this, the federal government, is taking this sort of passive role in this system. And he ends up writing this really interesting article which had a couple things that jumped out at me. One was he talked to the federal officials, including the person at FEMA, and he talked about this, that, "Federal officials say it's not their role to warn the public about missiles. FEMA will tell the states that there is a missile inbound and where it's going to land," says the head of engineering for IPOS.

IPOS is the name of the emergency management system. "And then the state will initiate any plans it has in place, one of which being to issue an alert to the public, telling them what to do." But Martin Cast the reporter went on to to call people who worked in state emergency operation centers and they were completely shocked to hear this. They actually said, Francisco Sanchez

Jr, the deputy emergency manager coordinator for Harris County, Texas, which includes Houston, says that he assumed that the public message would actually come from the federal government. "Military events are not something we envision or have within our scope or of our responsibilities to alert for." And he went on to talk about how he was just baffled by this, he didn't understand how this was going to actually work.

So we ran into this thing that the reporter pointed out that had not occurred to us, which was there is no clear authority as to who actually sends out the message. The message is implemented as a nationwide network, but the way the US works is not unlike the way voting works, the states have a lot of control and they want that control. And in fact in the United States, it goes down to the county and the city level and it can even be used by university campuses so they can send out alerts to just a campus, companies can get their own version of the system and send out alerts to their corporate campus. And in this day and age where it's not, unfortunately, unusual to have a active shooter drills and worse, active shooters, having that type of local control makes sense.

And you don't necessarily want everybody in the state to get a message that there is flooding in a remote city, you want everybody in the city to get that message but you don't necessarily need everybody in the state to get that. But who's the authority for this? So we started doing more research and we dove into Hawaii since this is where this happened and we wanted to really sort of take apart what was going on here. It turns out this all started in November of 2017 when a couple of high placed world leaders were tweeting about how big their buttons were. And this concerned the Hawaiians who typically don't pay attention to Twitter, but being that they were sort of directly in the middle of these two world leaders and sort of the first place that a North Korean missile might land, they got very concerned.

And they put together a 47 page emergency preparedness plan for which basically documents all the emergencies that they are prepared for but in this edition, out of the 47 pages, 24 pages are about a nuclear missile strike. And when you read this document, it's harrowing. It turns out that in the off chance that the North Koreans launch a missile aimed at the US, the closest point is of course Hawaii, so that's it's most likely destination based on the ranges they've already shot at. And it turns out that according to this report, it will take the US Pacific Joint Command a full five minutes to detect that this meant that this missile is coming our way. And then once that detection happens and that message comes in to Hawaii state warning point, they have a procedure for dealing with it that takes another five minutes, which is part of what that message was that, that poor employee sent out.

That takes a full five minutes for them to go through their messages and that then means that the residents and people on the islands of Hawaii have 10 minutes to be able to find cover and get to safety because it will take only 20 minutes for that missile to hit ground. Now we won't know until it lands whether it's a nuclear weapon, it may just be an empty missile, it may have a conventional warheads in it or it may in fact have a nuclear warhead in it, but that whole process takes no more than 20 minutes. 20 minutes, that's it, for them to react and work on this and they

don't even find out for the first five minutes. Oh, and by the way, the reason it only takes five minutes for them to find out is that we currently have troops on the South Korean Peninsula at such time that we would draw those troops from the South Korean Peninsula, as some people have suggested would be a cost saving measure, we would then extend that time of detection to 15 minutes.

So this turns out to be the thing that is just the most chilling part of this report is just how little time this design of an emergency management system has to react. So I don't know about you, but I don't want people having to say, "Anybody know the password for the message system." That's something that they need to have at their fingertips ready to go and be able to send out. I'm not sure we want to, are you sure 1.4 million people should get this message thing being, "Oh, I don't know." Again, we've got a very limited amount of time here. So this was one of the comments in the article is 18 minutes before missile gets here, who am I going to call it the Department of Defense if I get that alert on my phone to verify this is real? Who can I get confirmation and double confirmation from to make sure this is an authentic alert. This isn't the result of a hack. This is a mistake. By the time I've done that, something's gone 'boom!'"
This was again the head of emergency operations for the county outside Houston and he was unaware ... Hawaii is actually unique that they have something set up with a PACOM joint operations, most states don't. And so this is the problem. Now all of this goes back to the 60s. "This is a test. This station is conducting a test of the emergency broadcasting system. This is only a test." This was the original emergency broadcast system. It was an audio system, so it communicated from one station to the next over audio. Those two tones you hear, there are two of them, two frequencies, were specifically created because there are machines that sit listening to television watching I love Lucy or whatever else is on and they then take that message and they fire up this thing.

And this is an old teletype machine and the tapes that were used to then send messages to the next station creating those two tones, they had a name, they were called templates. This system that we use today has its heritage way back to the 60s and it was this voluntary propagation system. One station would would play these tones, other stations would listen and then play tones on their station, which would then propagate all the way through the country and every time we had one of those tests, it was actually the test to make sure that equipment actually registered and could hear the system and then would propagate it to the next station. Okay. This is the system today. This is a the architecture for IPOS and you can see that it is a much more comprehensive, much more complicated thing.

And one of the things to point out is that on the left are all the different ways that messages can get to you. You can get it through television, you can get it through your mobile phone, you can get through the Internet, you can get it through those big signs on the highway. This one system does all of those things. And so when you see an amber alert or you get that phone message, it's coming through all of those different mediums simultaneously and it's initiated through a piece of software that's on the left side of this that could come from any of those agencies. And it comes from what's called an alert origination tool. And it turns out there are 23 approved

vendors by the Department of Homeland Security for making alert origination tools, and these are software companies.

There used to be more, but they slowly have been going out of business because there's not a lot of money to be made in amber alerts and tsunami warnings and the occasional false missile alert. So they've been building out other systems and there are sort of vendors that do lots of different things, some of them make the hardware that sends the messages, some of them do other sorts of governmenty things. But they are part of this crazy ecosystem of things that are all involved in sending out this message. So we have the Hawaii state warning point, they're the ones who send out the message. Their procedures are created by their mother organization, the Hawaii Emergency Management Agency but they also have a relationship with US PATCOM and they also use a system that is created by FEMA and managed by the FCC.
That was because the FCC had the original emergency broadcasting system, they still own big chunks of this network. And then now you have the 23 different alert origination software providers. And so if we're going to create something that's going to prevent people from sending out emergency messages while at the same time allowing us to make sure that the real message gets out in a timely fashion, if we're going to create a design for this, who does that? Who is in fact responsible for the design? That's not clear. Now design, the definition of design that I've found to be most useful is the rendering of intent. A designer has an intention in the world, they believe that that intention should become real. We want to render that intention, so that sort of asks the question basically, who is responsible for choosing the intention of the design? Someone has to make that call.

Most of the designs that we work on, there's someone, there's either us or the business people are a product manager, someone is making the call. Someone is making this decision, they have the authority to do it. We just follow through or if we have the authority to do it, we can persuade others to follow through, that exists. And that that ownership also has a name. It's called governance. This was a term that I first saw in the UX world, in the world of content strategy, content strategists talk about governance all the time because it turns out that one of the problems of content strategy is that you have all this content out there but nobody seems to own it, which means nobody knows when it needs to be changed, when it needs to be taken down, it just sort of floats in the ether.

And so part of content strategy is establishing clear governance for every piece of content that's out there, who owns this thing, who has the right to change it, who has the who has the responsibility to take it down when it's no longer valid or needs correction? And so governance is key, but in the rest of the UX world, you never hear this word, you never hear the word governance and I think that's about to change. The problem is, is that we don't know who owns intention when there are multiple organizations involved. And this idea of having multiple organizations, this is a big deal. This is something that we haven't really prepared well. This is Ray and Charles Eames. You may not be familiar with them, but you are definitely familiar with their work.

They were incredible designers in the 60s and 70s and much of the things that you see today started with them. They made iconic furniture, they've created all sorts of incredible different types of systems. Big companies like IBM hire them and the people in IBM today, design today, refer to them as a major influence of the work that they do. And one of the things that they did in the 60, in 1968, was they created a movie, a little seven minute movie called The Powers of 10. And if you've never seen this movie, you probably have, it's like required showing in every grade school. But if you haven't, by chance, if you've somehow escaped education where you did not see this movie or you don't remember it, I highly recommend you Google it and watch it for its full seven minutes.

It is a marvel of design and it's particularly marvelous because it was done before computer graphics existed. So it's this completely awesome hand done animation that is just stunning and it's work but the reason I bring it up here is because of the story it tells. It talks about this idea that you can place a camera above a scene, in this case about a meter above this scene of these two people resting after a picnic in a park, and if you start to pull that camera back by the powers of 10, you go from one meter to 10 meters, suddenly you get a different frame of reference from what you originally saw. You pull it back again, we see more of the park than to 100 meters, now we see the marina that the park is embedded in and when we pull it back to a couple powers of 10 to 10,000 meters we can see most of Lake Michigan and all of the city of Chicago, that that marina was in.

If we pull it back further, we learn that Chicago is still on earth, and if we pull it back further, we learn that we are still inhabitants of the Milky Way Galaxy. This keeps pulling back like this and then halfway through the movie it starts to zoom in again and actually goes down to the micron level, 10 to the minus 14 or something and sort of shows what's happening at the atomic level. It's really a brilliant piece of work and all these things are moving and vibrating and animating and it's like, wow, how'd they do that in 1968? This movie came to mind when I was thinking about this problem of governance because it sort of talked to me about the fact that we work at different levels in our lives all the time. An astronomer for example, that wants to study the stars uses different tools depending on which of those magnifications, which of those scales, which of those resolutions they might be working at.

This type of telescope will get you so far. But if you want to see something in more detail that's farther away, well you need a bigger type of telescope. If you want to see something that's even farther away, you need a radio telescope. If you want to do something even further, you have to get outside of the earth's atmosphere and use a Hubble telescope. Each of these things allows us to see more resolution, to see a bigger picture, to see a different frame. What struck me was that every sort of zoom out, every resolution that we're working at requires a different tool. That started to help me understand what was going on, but it's not just the tools that change the problems that we deal with change. Let's take the problem of pollution. The problem of pollution at that park resolution is a really about litter.

We're worried about the grass getting, getting all grossed out with crappy litter and people's stuff. We can keep it clean at that level, but that's a different problem than the resolution of the city. If we deal with pollution there, it's no longer just about litter, It's about how do we manage landfills and how do we handle the massive amounts of trash that the city produces? We pull out even further to the earth a planet sized thing, now we're dealing with pollution and its effects on climate change, which I'm told still does exist. That is a different level of thing. Of course we pull out into space. Well now we actually have space junk. There are millions of pieces of material that are floating around the planet, that create any of sort of future space travel and orbiting space station type stuff.

Put it in real risk because it's moving at 17 million miles per hour and it can do real damage. The thing here is that every single one of these resolutions has a different set of problems associated with it. Everything is changing. Each of those different resolutions require different solutions for those problems. We can't use the litter, whatever we come up with to keep the park from getting littered, having a large amount of trash cans around and social pressure, that won't help us with say, space junk. It's just not the same problem. If we think of design as the rendering of intent, we have to realize that at every level our intentions have to change. We have to have different intentions. The way we render those intentions, the way we make them real in the world that has to change.

But what's fascinating to me about this is the idea that design is the rendering of intent that actually doesn't change. Design itself doesn't change, just the intentions and the rendering change. We can still use design, the basic elements of design to help us understand and how to solve these problems, but we have to change the way we work at every resolution. Now, I started in this business in the late 70s and when I started, this was the most popular UX book that had ever been published. It's called The Guidelines for Designing User Interface Software came out in 1984. It was written by two amazing people, Sid Smith and Jane Mosier. They get absolutely no credit these days, but they started everything we do. It was their work. This report had been written by the air force or paid for by the air force.

They worked at MITRE Corporation. The air force was dealing with the problem of this. They had all these computer systems. They were dealing with the problem that still exists today that Nathan is still working on today. This problem that every user experience was completely different in bespoke, and nobody could figure out what to do. The air force was making a major investment in technology, and they wanted to have some sort of unified set of rules that everybody could follow so that designs work consistently across. Smith and Mosier decided to create this set of rules to create these guidelines for what were called at the time green screen displays because they were green phosphor. That was the most efficient way to use these cathode ray tubes. They created this massive document, it was 242 pages of guidelines that described every little way that you could do anything on a screen.

It was just this huge thing and they did this really yeoman's job of connecting this up with all the

available human factors research that had been done and everything that was out there so that every single one of these guidelines had a research basis to it. It was really an incredible piece of work. They basically boiled all their descriptions down to five basic guidelines; consistency of data entry transactions, minimal input actions by the user, minimum memory load on users, compatibility of data entry with data display and flexibility of user control of data entry. While this wording is a bit staid and archaic, these basic principles, these are principles we use today. This are still the principles of good design. What's Smith and Mosier did in 1984 was good design. What's even more amazing is that even though these were the screens that they were designing for in 1984, these were the things they were focused on. Those guidelines are still applicable when we move into the 90s based displays of modern windows apps and, the more modern looking displays of the technology of today. All of those guidelines are still applicable here. They still solve the problems. That's because this idea of designing a screen, this is a resolution. This is like that park level of resolution. It's, very honed in it's a single thing. In the 1980s, this is what we were focused on. We were focused on creating UIs. That's how this conference got named. This first conference was about how do we design these types of things? When we did the first one in 1996, it was intended to continue the legacy that Smith and Mosier had started.

What we were teaching at those times were tools that were specific to UIs; UI components, form guidelines, usability testing and heuristics. I'm not the biggest fan of heuristics, but yeah, they're out there, but that's what this was about. This was about that sort of level of resolution and so we were focused on the screen. Now not too long after that we started to make things bigger than a screen. It was not about having one screen versus another screen. We started to move to things where screens were knitted together in a flow and we started to think about, well, what's the relationship of the things in that flow? We started to build websites where we had to think about what are the pages on the website and what were their relationship to each other and how do people progress through these flows?

This is not a different type of design, but it is has a lot of differences from the screen level stuff, so it's a different resolution. If we pull the camera back, we're now not just zoomed into the screen, but we're zoomed into the application or the site and now we're thinking about what we would call today UX design and information architecture. This sort of notion of how do things fit together of this bigger whole and we had a different set of tools for doing this. Wire frames don't really help you with screen design as much as they help you with this sort of flow site maps even more so. Tools like card sorts or doing field based research. These were things that we didn't really do back in the day, when we were thinking purely about screen level design that we now have to think about.

If we pull the camera back to a new level, we get into thinking about, well, how do app start to work together? We get into things like service blueprints that sort of tell us what's happening front of stage and back stage and who were the different influencers and users that we have to interact with and what are their roles in this thing? Now we're working at this sort of organization wide level, where the digital experience of an APP or a website, is just a piece of a bigger whole. Sometimes there's more than one and, and they have to connect to each other. Now this

is what we talk about when we talk about service design or experience design, is that this sort of bigger resolution. At this level we are thinking in terms of journeys and design systems and ethnography and whatever design thinking is.

All of these different resolutions is what we're working on today, and we keep trying to divide them up, right? To some extent, this is what this argument is when we talk about, you know, I hate when people say that the position is a UX, UI designer, they are different things, but they aren't different things they're different resolution. Maybe what that team needs is someone who can move freely between those resolution. Someone who can get down to the UI, work in that level, and then zoom back out and work at the UX level. Maybe that's exactly what they need. Not some notion of someone who doesn't get it, who doesn't understand what we do. Maybe we don't understand what we do. Maybe the fact is, is that UX design isn't the right thing. When I hear these discussions about is service design part of UX or is UX part of service design, no it's not about that at all.

Its service design deals within at the organization scale and UX design typically works at the application scale or the site scale, and then UI is lower scale. We can think of the work that we do in terms of this. What was fascinating is once I sort of figured this out and I went back and looked at that diagram that we'd created about the Hawaii missile crisis, I realized that you could actually divide it up. The design Twitter was talking in order. They started at screen resolution issues and then they pulled back and we got to application resolution issues. Then we pulled back again and we suddenly got to organization resolution issues. That in fact all of these problems were problems were embodied there, and if we're going to solve this, we have to solve it at all the levels.

But what was even more fascinating to me was that authority thing, where the hell does that go? That's not any of the previous resolutions. Suddenly we're looking at something we've never seen before, at least we've never known to look for before. This was fascinating to us. We started to talk about this, ecosystem design as a new type of resolution. This is dealing with this problem that once you get beyond the organization, we are now at multiple levels. We're now looking at multiple organizations. We're looking at that chart and where does it go? What are the tools that we use for this? I don't know, I don't know what the tools are, but I'm okay with that because when I was starting in this field and we were working at the UI level, and we were focused on screens, we did not have the tools for the application site wide level.

When we were working there and we started to realize, well, these things have to work in conjunction with each other across the organization, we did not have the tools for service design for what we call today. Those things were invented because we needed them, but we didn't have them at first. They weren't always here. Once I started looking at this resolution, I realized I'd been seeing it everywhere I just didn't know what it was. You do you see it everywhere now. This whole thing that was pressing the wrong button thing okay. They have to do the conference over. Once I started this whole thing with Facebook and Cambridge Analytica, it's this multiple

organization thing. Facebook claims that they put out this terms and conditions and Cambridge Analytica didn't follow them.

Cambridge Analytica says no. we were given the data. We could do with it whatever we wanted that's what we thought. Who is right? Who has the governance, I don't know. Or this issue around the problem of delivering healthcare services, right? This is a big, gnarly problem. Who owns this? The doctors, the hospitals, the insurers, the government who has governments in this area. Not Clear, right? This is a big gnarly problem. These problems are everywhere, once you start to look for them, they are everywhere. We can think of this idea of going from screen to application to organization to ecosystem. These are levels that we have to get comfortable with, and the reason that we can now see this is because we've pretty much got under control all the levels below it.

It wasn't until we had the organizational levels, that sort of service design stuff that we could start to even see the ecosystem stuff, just like we couldn't see the organization level until we had an understanding of how to handle applications. That is really important. This idea that when you solve this, and Nathan mentioned this right, that it isn't until you start solving the problems and you really get a handle on them, that you start to see the problems that you can't solve. They come into focus and you're trying to figure out why are they not solvable? The ecosystem design issues are really sort of our toughest challenges. These are the ones that are going to be the main area of focus for I think the next decade. They are going to be the big change that we need to deal with.

We have to understand that just by solving problems which we've been doing, we reveal a new level of problems that we never knew existed before. The good news is there are people out there smarter than me who are already solving these things. This is Arielle Kennan. Arielle worked for the mayor's Office of opportunity in New York City. While she was there, she took on the intractable problem of dealing with getting a handle around the 45 different government agencies that are involved in dealing with the homeless in New York City. Some of which work for the city of New York, some of which don't. She started to take service design beyond its limitations of just what can the city of New York do, and started to look at what happens when all these organizations work together.

Started to establish a method of getting those organizations to work together to create systems. They mapped out and started to make some huge progress on some of the more intractable issues inside the homelessness problem in New York. At the same time, one of my coworkers at the digital service, Tracey Walker, was doing some amazing work. In that she dealt with a completely different intractable problem. Probably what is the biggest problem in user experience work today, particularly in the federal government, which is procurement. Procurement being able to hire folks is a really hard problem to solve. It turns out it's really, really difficult to build teams that can work agilely inside an organization that for decades has only ever bought things like battleships.

I don't know if you know this, but it's very hard to build a battleship with an agile method. Waterfall was invented for battleships and I'm actually not making a joke there. It actually was invented to build battleships and, because you can't be off saying, well, we don't know exactly what the battleship will look like, but we're just going to iterate until we get something we like. We'll do some discovery sprints maybe shoot a gun or two. The government doesn't know how to do that, so instead what do they do? They build large, massive things and that's how they thought they were supposed to hire for systems. What Tracy was able to do, Tracy and her team, she had an amazing team working for her at the White House. She was able to rewrite something known as the tech FAR the technical federal acquisition rules, technology federal acquisition rules.

She was able to get those rewritten in such a way that they were able to higher agile teams and use them agilely based on their ability to produce great work in an agile environment, not based on their ability to create a specification that said exactly what they were going to ship when. Which doesn't feel like a very agile way of getting and hiring people. Of course, you've already met Dana. One of the things you don't know about Dana, is that she teaches at the Harvard Kennedy School. She has a course there every year that she teaches to policy makers with the intent of teaching design practice, in particular, research practice to people who make policies. These are people working in this area of governance who have no idea what research is, and so teaching them research turns out to be a huge deal.

Now, if you think about it, all of these folks are basically working with teams, educating them on good design practice, but they're not educating them on screen design or application design. None of the folks who I just mentioned are working at that level, where they are working is at the organization and ecosystem level. That's where their work has to be. They are focused on that and they're blending those two levels to get the outcomes that they're looking for. Using the tools we already know of service blueprints and then creating brand new tools, that are helpful at the ecosystem level. One could say that they are making this up as they're going along because no one's ever done this before, and that is the job of pioneers. Pioneers go out into unexplored territory and they figure out what the landscape is and how to navigate it.

They learn how to survive in these places that no one's ever been able to survive before. This pointed me to the work of Simon Wardley. Simon Wardley is this brilliant guy. He's one of these people who every time he says something, I go, wow. Then about six months later I go, that's what he was talking about wow, wow, wow. His stuff has this incredibly late in effect on me, but it's brilliant as far as I'm concerned. One of the things he wrote about is this notion of pioneers, settlers and town planners. The idea behind this is that there are pioneers in the world, pioneers who are people like Dana and Tracy and Arielle who go out and navigate these spaces. They are the ones who discover the basic necessities. Now I'm cognitively aware that this idea of pioneers and settlers is very much a colonialist attitude and that doesn't have all the best of connotations.

If we sort of for a second, unless we can come up with better terms sort of step away from the downsides of colonialism and just look at this idea of exploration and understanding. The pioneers are the ones who really sort of understand what is happening here. The settlers, they're the ones who take that and make a production out of it. The planners are the ones who then productize it. We can look into this a little deeper and say, okay, well Wardley's world, mapping it into what we're talking about here. The pioneers are the ones who are exploring this new resolution. They are thinking about what it takes to work at this space and just mostly just creating a map of what the landscape is. That's their most important contribution. What does this organizational thing look like?

What are the different variations that happen when we have multiple organizations involved? How is that working? Settlers on the other hand are going to be the first ones to sort of figure out how to get value out of it in a continual way. When I started in this business, I started with the pioneers in UX. UX people ask me how I get started in UX I didn't. I was a software developer who just was interested in how anyone was ever going to use the crap we were building. UX grew up around me I mean, I never said, well I want to be a UX person when I grew up because it didn't exist. It was like, no, it just sort of came around me. To some extent I was hanging out with the pioneers, but the settlers is where I got really interested, because these people were using the methods.

This conference was really about spreading the ideas that the settlers had about how we do these sorts of things. They're the ones who are sort of the first builders of this stuff and they are the ones who sort of craft the initial things. I was in the room for the very first usability tests that were ever done in a usability lab. The team that I worked with built the very first usability lab in Maynard, Massachusetts. The practices that people use today, like telling a participant that we're not testing you, we're testing the design that came out of that group of people and we had no idea what we were doing at the time. Kim was talking about consent and we were so concerned about people's consent in those usability tests that we went to the American psychological association, and we found the consent forms they were using and we crafted consent forms for usability tests.

This forms that people use today are derivatives of the work that we were doing. We didn't realize that we were the settlers for that domain at the time. Then the planners, the planners are the ones the town planners are the ones who build it at scale. They're the ones who create all this stuff, different levels of things. They're the ones that craft all of the different elements. They end up building completely at scale what's going on? They bring it to this larger thing and put in processes and tools and all the different elements of it. We can think of these different scales, and we can start to say, well, when do they actually start? The screen resolution stuff that was happening in the early 70s when the green screens came out. The application stuff that started in the 80s.

In the 90s is when we got to this organization level and here we are in the late 2010s 2018, and

now we're starting to become aware of this resolution level. We can then say, well, where did the pioneers and the settlers and the planners come into play? We can see that, that as we progress through this process, at every level pioneers came in, then settlers, then planners and that pattern repeats and this is good news. This means that for the ecosystem level where we just are now getting to the pioneers, we're going to have to figure out who the next settlers are, who the next planners are. There's going to be a ton of work here for us, and we'll be able to derive from this. Now Sid mentioned that we should have the opinions and I certainly have been known to have one or two.

One of the ones that gets me in trouble on Twitter on a regular basis is this one, this idea that anybody who influences the design becomes a designer. There are a bunch of people who agree with this a lot of people who think there's a great idea. There are a whole bunch of people who think this is a horrible idea because if we take away the label of designer and we give it to everybody, what are they going to do? My answer to that is they're going to get to work on the really hard problems. Imagine you have a developer who actually can design stuff decently? You don't have to draw out the dialogue box in 20 different states for them to make sure that they do it right because you don't trust them. Instead, you can go to a whiteboard and draw something out and you can hand them a design system, and they actually build something that is pretty darn good from the very beginning.

That to me is great. That means that we as designers get to, we as the ones who identify as designers get to work on the hard problems. But nonetheless, there are people who don't agree so much so that my friend Sarah Brooks is telling me that I need to put a trigger warning on my tweets for every time this happens. Every time I talk about this, people have all sorts of crazy reactions. But here's the thing. This is what I'm seeing people like Tracy do. Tracy is coming in and she is a making designers out of contracting officers, helping them understand how to make smart design decisions. What is the intent, how do we render it? That's what she's doing. Dana is teaching policy people how to do research. Like really hard no, I'm not giving you the answer research. She sends them out into the world and they are like, aren't you going to give us a spreadsheet with numbers for us to crunch?

Like, no, go get your own numbers. Nobody gives you a spreadsheet with numbers in the real world. You have to get your numbers right and it's going to be messy and dirty and teaching them how to deal with that. This is because everyone needs to understand how to be a UX designer, how to be a UX professional. I bunch researcher and designer together these days because the distinction is really not important anymore. The thing is, is that I am really of this camp that everyone in fact needs to be a designer. We have to treat them like that. It doesn't mean that everyone's going to be a good designer. In fact, we know that everyone's not a good designer. We already work with people who call themselves designers who are not good designers. This is not the problem. The problem is, is that everyone can become a better designer.

Even those people who are pretty good can become a better designer and we need to build the

tools to help them become a better designer and that's what people like Tracy and Dana doing. They are building tools to help everyone become a better designer. I really think that this is a core piece of what we need to do to deal with the ecosystem level is to actually expand. Because in fact, that is what we did at every other level, was we started to help people become better designers. Part of this is our own fault. We create this problem. We do things by creating things like the t-shaped person and saying, well, the t same person is an information architect who has a lot of knowledge and information architecture, and Jay a little bit of knowledge of other things.

They can work at the application level and a user interface designer, well they can only work at the screen level. A service designer, well, they can only work at the resolution of the organization level. Who's going to be working at the ecosystem level? It's going to be us, right? It's either going to be us or it's going to be somebody who doesn't exist yet. I think it's going to be us, I think it should be us, and so we can't think of ourselves this way. Instead, the way we need to think of ourselves is this way, right? We need to think of ourselves as having lots of different skills. This notion that you're a master of all trades means you're Jack of all trades, master of none. That's the saying, Jack of all trades, master of none. That idea is just patently wrong. There's no evidence in educational theory that supports that idea.

Someone it implies that when you learn new things, you get worse at the things you used to be able to do, right? If you are an amazing guitar player and you learn the piano, your guitar doesn't suddenly get worse. It gets better, so none of this makes sense. This idea that we can have more than one set of skills, that there are different levels that we can grow those skills. That's what's important. In fact, if we're going to put teams together, what we really need to do is have those teams have different skills on them. When we talk about multidisciplinary teams, what we're really talking about is having multiple skills at what we call this format, the broken comb model. It looks like a broken comb and everybody's got a different broken comb. Wherever the long times are versus the small short times, that's because we've got lots of skills on the team.

Only then particularly when we're working across multiple organizations, is it going to work that we can start to talk about how we think about solving problems. When we're spanning resolutions skills are way more important than roles are. We have to start thinking about what are the skills that we need for all the different resolutions? Now that we're zooming out to the ecosystem level, what are the new skills that we're going to have to learn, we're gonna have to create, that the pioneers are going to discover and the settlers are going to reinforce, town planners are going to build at scale? What are all of those? We need to zoom out from what we thought UX design was from what we thought the landscape was, and see this world in a completely new way because that's how we're going to do design a better world. That's what I came to talk to you about.

We need to learn how to design across these organizational boundaries. We need to understand what governance is about. We're going to have to solve problems at every

resolution so we need the skills to be able to do that. Ecosystem wide design is really, I think, the next frontier. We need to understand how we move there and who's going to be the drivers there. There are opportunities that we don't know today, and we're going to see leaders emerge there that we've never met before. We're going to see people here who possibly in this room who will lead that. Finally, it's UX design resolutions all the way down and we have to be comfortable shifting from one to the next to the next, and not put up these artificial boundaries that claim that I can only work at one level and you can only work at a different level. That's not going to help us at all. That's what I came to talk to you about.

If for some reason you found this the least bit interesting, I write about these sorts of things all the time. We do this on the UIE.com site. If you are not connected to me on LinkedIn, that's a fantastic place to do. Find me on LinkedIn J.M Spool is my handle there. If you use that or you could just type in Jared Spool, I guarantee there's currently only one, or you can send me an email at that address. Finally if you want to join design Twitter and you want to be part of the conversations of design on Twitter, on the Twitters, I tweet about design, design strategy, the design experience, and the amazing customer service attitudes of the airline industry, talk about ecosystem design. Ladies and gentlemen, it has been truly a pleasure to host today for you and I hope you enjoy the workshops tomorrow. Let's go get drunk. Thank you very much.