Eric Holdeman:

I am Eric Holdeman. And this is Disaster Zone, a podcast about emergencies and disasters of all time, Disaster Zone will bring you interviews with people, dealing with all aspects of disasters and what causes them to help people and organizations are dealing with their impact.

Here's today's program. This podcast is being sponsored by Dynamis, a leading provider of information management software and security solutions. You can find them at dynamis.com.

Welcome to today's podcast. With me today is Hans J. Scholl who is a full professor in the Information School at the University of Washington.

I will be talking about the effects of WebEOC, a crisis information management tool and information systems in general.

Welcome Hans. And I know you're in Spain.

Prof. Hans J. Scholl

I am. Thank you for having me, Eric. And it's your morning. It's my afternoon here.

Eric Holdeman

Okay. What time is it there? 7:00 AM here on the West Coast

Prof. Hans J. Scholl:

Shortly after 4:00 PM.

Eric Holdeman:

Okay. Well, there you go. We'll get this over and you can have dinner, you and I have discussed WebEOC and information systems quite a bit. And before we get into that though, and the WebEOC platform, how about getting a brief synopsis? What are your academic credentials in your area of expertise because you are an authority in this area.

Prof. Hans J. Scholl:

Oh, thank you. Well, I'm a faculty, as you said, at the information school, I joined the Information School in 2003. My major areas are of interest in the broader field of information management are in particular digital government. And from using technology in government, I got attracted and basically my nose was wrapped into disaster information management. When I received a grant from the National Science Foundation to look into how mobile devices in the early two thousands could support field operations. And that was when I came into this kind of study. I also do user usability studies ,and I'm also on the board of the ISCRAM society, which is the society for Information Systems for Crisis and Response Management, an academic institution.

Eric Holdeman:

Okay. Well, certainly you have a depth of both knowledge to begin with and then some experience in the field and credential there. How ddid you get interested in the disaster information management system, and, in WebEOC in particular?

Prof. Hans J. Scholl:

When we got that grant and studied Seattle Public Utilities, and I came across disaster preparation. By that time, I also became aware of that I had moved into an area, the Pacific Northwest, is highly compromised potentially by, in particular, of major earthquakes. And actually then those two things together made me very interested in it, and it is still also part of digital government. Then I began to study disaster responses of professional responders, and I was pretty much interested in the beginning, because I come from the information side of things, in situational awareness and how a common operating picture shapes up for professional responders. And when you look into that, you immediately find another important aspect of our response management. And that is all the managerial challenges that come with it, particularly when it comes to multi-jurisdictional coordination, collaboration between agencies. With regard to information management situational awareness is key. If you don't have that., and speaking of an emergency, an if you don't have that, you don't know where to apply your resources, the areas that need help areas that may be screaming for help, but aren't hit as hard as other areas. I mean, it's just key to everything I think is knowing the situation. I mean, whether it's in combat or in a disaster, that's no different from the military in that regard. .

Eric Holdeman:

So you studied disasters and even participating in a large disaster excise to obtain some firsthand information. I mean, as a, as an observer off this if you were going to design a disaster information management system, what would be its major characteristics?

Prof. Hans J. Scholl:

In the US we work, and I guess that is a a solid thing, now under the National Incident Management System's (NIMS) doctrine and as part of it, ICS, the Incident Command System. That is the doctrine under which basically emergency management and disaster response management are conducted in the United States. It is this unifying doctrine. And there is a core document of 2008. It's a very interesting document from back then. And I cannot agree more with those NIMS architects. They said, an information system that serves under NIMS for emergency management has to be interoperable, both vertically and horizontally. It has to be easy to use, simple, and it should be even simplistic. And here is what I add: the information systems should be NIMS standardized, and then here it comes, it should be scalable. That is what these people back then already deeply understood. It should be flexible. It should be reliable and robust, so it cannot break down easily. It should be able to be used in a single-jurisdiction response, as well as in multiple-jurisdiction responses. It should be adaptable, and I found that so foresightful from those NIMS architects, to new technology, and it should be safe and well shielded. It may not be an open platform where everybody can hack into. And so those were the recommendations back then, and I cannot agree more. Those are the principles for any system that we use, be it locally, County, State, or nationally.

Eric Holdeman:

Okay. And , what I observed is that I've been through several iterations of disaster management information management systems, and I've participated in several failed efforts, and they've evolved over time and that, and but I'm not an IT person on that certainly. As a university professor, yhave you looked at different information management systems, software platforms, and what have you discovered about them in general or in particular?

Prof. Hans J. Scholl:

The current de-facto standard is WebEOC. It is used in many jurisdictions all over the country. It is interesting to go back and look at how it came to that. In 2002, the National Institute of Justice (NIJ),

which is the research arm of the Department of Justice, per the request of States did an analysis. Notably, it was not FEMA that led to the investigation then. This NIJ report then led to the situation that more and more States followed that recommendation, which was not really a full recommendation, but rather feature comparison survey only. They never performed load tests, or scalability tests, or anything. All the points that the NIMS architects elaborated previously mentioned were never tested.

Eric Holdeman:

When you say, look, test, do you mean like the stress stuff?

Prof. Hans J. Scholl:

If you have N number of jurisdictions into operating horizontally and vertically, you want to know where is the breaking point? You need to know what is the lowest bandwidth, with which you can still have operations. Now, what I found in the studies is that besides WebEOC, you see all kinds of systems, for example, homegrown systems, SharePoint-based operations, and at the University of Washington, my university, with their own Emergency Operation Center, they use a web-based spreadsheet that helps them organize their responses. And there are completely unstructured systems, such as email, and very recently, there is a new commercial system, VEOCI, but we have not really looked into that one and have not seen it in operation. It seems to be a rising new star on the horizon provide by a company operating form Connecticut. And there seem to be quite a number of jurisdictions around the country that appear dissatisfied with the situation that they've found themselves in with a WebEOC, or they wanted to move forward for other reasons. And they seem to now begin to test that new system. But I have to say, we have not had our hands on that on that and have not seen how it is working.

Eric Holdeman:

Well, my observation has been that companies spring up, they have a good idea. They think they have a better mouse trap to do this. And they likely to their local emergency management agency, whether it's in Pennsylvania or another state, like say here, Connecticut and they'd say, well, we're not that happy with WebEOC, so we'll try this. So they get this foothold and then it's used in that general area, but then it's very difficult to swim against any technological tide, you know, and someone came in and was going to replace Microsoft 365. It would be a battle, right? And, to have something like that happen at the end. And, we saw that with Gmail, replacing Outlook, if you remember those days, a few years back, 10 years or so, but there's a lot of resistance to change and familiarity, even if you're not happy with it, causes people to use it. So you've done a deep dive into WebEOC and looked at it from a technological standpoint. And you also observed it being used in a larger disaster site. So what did you learn from that?

Prof. Hans J. Scholl:

To sum it up, WebEOC is highly configurable, so you can have your own tailored version. However, the software has gone through several versions which are not necessarily compatible. And as long as you only talk about an everyday emergency or something that gets a little larger, maybe, and it's still in one jurisdiction and the jurisdiction doesn't have to communicate outside, then you may be fine with WebEOC, even though I come to a few sort of limitations in a moment, I don't want to make it too technical.

Eric Holdeman:

Dealing with people like me..

Prof. Hans J. Scholl:

Exactly. For the small scale, for the single-jurisdiction response WebEOC, despite the limitations that I will talk about, may work quite nicely. The breaking point though comes very, very quickly. The moment you scale it up and go, even into something like the 2014, OSO-SR530 landslide situation, where you have multiple jurisdictions all of a sudden, the State, the County the locals, FEMA, and they all have to communicate, and they have to work together and already there and then, it was not working well, different versions and no interconnectivity. And let me talk about the limitations. WebEOC has a very hierarchical design. So you basically work with so-called Boards and you organize them from a user perspective into a hierarchy, and it quickly becomes cumbersome, and there is no exit button, if you want to go back in the hierarchy to the next board.

So for people who don't use the system on an everyday basis., it will be difficult to handle, particularly under the stress of an emergency response, particularly if the emergency lasts longer.

The other major limitation is that WebEOC is basically a logging system. It is sequential. Yes, something happens. Somebody puts something into the system, and the log becomes longer and longer and longer. Now we have a shift change, and now the next shift comes in. And basically what they have to do is to get up to date by going through the whole logged record. And, “ah, here is where we are now,” and the longer, the whole thing lasts, the more it adds. And there are no search and meaningful filter functions that work well, there is only a little bit of visualization. Moreover, there are many inconsistencies also in the internal design. The software people call that the so called “tech debt” if you do not develop something cleanly, it haunts you after a while.

And that is what we are seeing in WebEOC. Now, the breaking point during the 2016 Cascadia Rising Cascadia Exercise came when thirty counties wanted to connect to the State, and after one or two connected, and the whole system broke down completely. Obviously, Washington State has understood that. And, and they are try trying to host the system in a different place. We can only hope that the next time we get to this kind of stress, it will work better. But here's another aspect, the point that I also have made when we come to larger disasters, then we have to understand that part of the critical infrastructure, in particular, the communication infrastructure will be gone. As a consequence, we have to begin to rethink scalability.

The biggest concern that I have with WebEOC is both its safety and its security. Its safety and security are so bad that this issue even came before Congress. For example, you cannot directly communicate from your State WebEOC with FEMA’s WebEOC, or with a County WebEOC. What you can do instead is you file your resource request from the State to FEMA if you have a FEMA WebEOC account as a State. So, 50 States have 50 accounts with FEMA. What happens on the FEMA side is when they receive the resource request, they enter it into their FEMA system manually. That is grotesque in the 21st century. So, the various WebEOC systems cannot send safely resource requests directly into the FEMA WebEOV system, even though they are both using the same system .

In 2018, FEMA said again before Congress that theey cannot do it differently, even though it entails so much double work, error-prone double work, because it is unsafe to connect WebEOC systems directly with each other. And that is a safety and security flaw par excellence.

Eric Holdeman:

Okay. So, why do you think so difficult come up with a more functional system? You said already, people are invested in what they have?.

Prof. Hans J. Scholl:

That is correct. However, I want to look at that from a different angle, and I guess that discussion has not occurred yet. These systems like WebEOC, and I am not talking now about the everyday emergencies, but as we see the massive wildfires now in the West in multiple States, it really a disaster of magnitude. Resources have to be coordinated, and lives are at stake. So at this magnitude a system is mission-critical, it is mission-critical for our nation's safety. We have always agreed that we need a military, and that military cannot be a military of mercenaries, we rather have to do it ourselves to be safe. We have to have people who give their oaths on the constitution, and they want to defend the country no matter what. So, what we do basically is in this particular area where safety and security are at stake, we have forgotten this simple principle. When our national security is at stake we do things differently. That is why we have our own military. We now have larger and larger disasters, and therefore we have to rethink and understand that this is not an arena where we can leave it to commercial interests to help us out. As an example, Amazon, Walmart, as well as the military have their very own software with which they do command and control.

There is no commercial vendor in there that writes the software for them. Also in the private sector, as I said, Amazon or Walmart, their logistics systems and their whole system of operations is their strategic advantage, embedded in it is their knowhow, and, of course, they do that themselves. The same, I say, applies here in terms of the mission criticality. Mission-critical software like this is not a commodity like a car that you can exchange for just another one. You can buy a car from vendor X or a similar one from vendor Y, and you still can drive as well. However, mission-critical systems are very different animals. And, so, I advocate that this needs to be changed in the way of how we think about this type of systems.

Eric Holdeman:

You've advocated for a national system, that everyone is in it's, as you talked about, really scalable for catastrophic disasters and is the true standard right now, wherever you'll see, it's the standard just based on use. It was one of the earlier ones and go widely adopted. It was fairly cheap to use. So you spread broadly, but it's not a mandatory system. So you've got 3000 counties, you got the 50 States plus territory, and everybody's using different pieces that, and there's, they'll standardization within and even web you'll see for how it's being used. So you've advocated for a national software standard that's mandated and use. So tell us about that.

Prof. Hans J. Scholl:

I think this should be a national effort, but it must be a joint and coordinated effort from all levels of government. It is not that the Feds can take the lead here and say, we now give you a system that we have cooked up and you please take it. There is so much knowledge on the base levels, since every disaster is local. So, the knowledge about all that is local, but then come all the coordination problems. And that is where you have to have all the other areas and all the other levels of governments involved. And this needs to be an initiative that comes basically from all levels of government. I don't know what the best organizational format for that would be. Certainly, some major funding should come from the federal level.

Prof. Hans J. Scholl:

And that is justifiable because the cost savings through such a system would be tremendous. I just give you an example. On the other side of Lake Washington is the City of Bellevue. Bellevue is the lead in what is called the eCityGovAlliance. That is a number of municipalities that put their efforts and their resources together. And they built systems for all of the cities. And the cost dramatically came down. The expertise of the government was in there, not something from outside and, and they were in charge of their systems. And that could be a role model for something that we could then be built on a national

level. And that could then also lead to the consistency, not only in architecture and design, but also in implementing the NIMS doctrine, the National Incident Management System and the Incident Command System Doctrine.

Eric Holdeman:

We are getting near the end here, but I just, if she could give a quick comment, because I've fought this for many years: People develop a system and they keep adding alcohol and bells and whistles. It makes it so complex that someone can't come in and intuitively use the system without significant training. And that just doesn't happen. So what's the solution to that?

Prof. Hans J. Scholl:

The point is what all vendors dream of. I once worked for Apple. I once worked for a company like Data General. Whenever you have people in a lock-in, for example, take also Microsoft, they are very happy because from that moment of customer lock-in you are beginning to print money because now you decide what changes are made. You decide when upgrades are made, you decide the cost. That is the whole thing. And again, the mission criticality of these systems should open our eyes in that we cannot do this, what we normally do for commodity products anywhere, that we leave our safety and security at the mercy of commercial vendors. We have to change our thinking here, because currently we are in a lock-in mainly with WebEOC.

Eric Holdeman:

Okay, well. Anything else you'd want to say to, emergency managers who are probably one of my major audiences here, and I'm sure this other software developers will be watching this, listening to it too.

Prof. Hans J. Scholl:

I can only repeat, I guess, robustness of the system, scalability of the system, safety and security of the system are the key elements, and they are not fulfilled by the current systems. We also have to really consider offline operations and scaling in various ways. In a big disaster you are back to pencil and notepad and you have to scale up and down. And the current wildfires have now shown us again that most severe emergencies become the norm, so we have to have something that is robust, which currently we have not.

Eric Holdeman:

Okay, well, listen, this has been great connecting Intercontinentally here this morning. You know, I, I have a WebEOC survey out there now, and perhaps when we get a little bit more data and we can do a check in with you and see what those results show, and then share that with our audience. Also, since I think maybe their appetite will have been wedded by listening to this one podcast. So hopefully you'll do that in the future with me.

Prof. Hans J. Scholl

Absolutely.
Eric Holdeman

Okay. Well, thank you. Be safe. This brings us to the end of this podcast. Thank you for joining me today and sharing your experience and expertise and information management systems, a reminder to

everyone to be faith. Think about how disaster might impact you and your family and what you can do about it. Now, before that happens. Thanks to Amanda again soon. And bye bye.

Thanks for listening to today's Disaster Zone Podcast, tune in again, soon for more information on all aspects of exams and what people and organizations are doing about them can also check out the Disaster Zone blog at www.disaster-zone.com.