

Tech Talk Episode 12: Cell Phones

Man walks into an office talking on his cell phone, saying, "Yeah. I'll take care of it as soon as I sit down at my computer. Thank you. Okay bye. Sets his cell phone on the desk but it slide off into the garbage. Sound of a cell phone ringing. Man looks around desperately in his untidy office. He finds the cell phone in his garbage can under some paper and says, "Yeah. What do you want? I'm right in the middle...Huh? Now?! It's on now?"

Tech Talk Introduction Plays

Susan: Hello and welcome to Tech Talk your source for information on technology from the University of Minnesota. I'm your host, Susan McKinnell. Today we are talking about cell phones. Do they work everywhere? How do they communicate? What features are available? And how has the cell phone changed the way we live and work and play. Some of the tech terms that you'll hear today include protocols like, GSM, CDMA, and TDMA as well as the analog protocol, AMPS. To talk with us about those basic cell phone questions is Louis Hammond, Assistant Director of Networking and Telecommunications services for the University of Minnesota. He not only manages a group that installs, supports and maintains the U's telephone and data networking infrastructure, he is also the guy who headed up a project that replaced the U's entire telephone system. Louis, it's very nice to have you with us today.

Louis: Nice to be here.

Susan: Let's start out by... I know that cell phones work in a very different way from phones that you have in your house. How do cell phones work?

Louis: Yes, they do. Basically, a cell phone is a radio phone or a radio that talks to an antenna. And all you are doing is staying within antennas within a certain range. And then, there are multiple antennas that make up a network of cell phone technology.

Susan: So, you may run from one antenna range to another?

Louis: Correct.

Susan: But that process should be kind of seamless to the user. They can't really tell when they're...

Louis: In most cases it is. And in some of the rural areas it is not available.

Susan: Okay. So, you may move out of the range of one area.

Louis: Yes. Cell phones tend to have a three to five mile range from the antenna, depending on what's in the way and what kind of terrain is in the area.

Susan: Okay. I know that you can actually see some of these...what are they cell phone towers, or what are they called? I know we've got some pictures of some.

Louis: Yeah. There are cell phone towers and I've got a couple pictures of them. They are in various different areas. They are trying to be creative with those cell phone towers for aesthetics in some areas.

Susan: This one looks just like a radio tower.

Louis: This one does look like a radio tower but it does have cell phone antennas attached to the lower area.

Susan: Mm. So it isn't the things on top it's...

Louis: I believe multiple vendors can be on a single tower.

Susan: Okay.

Louis: They also place them on water towers.

Susan: Stuck on the side right there, yeah.

Louis: And any other kind of area that allows them to set up some kind of pathway to cars in the driving areas.

Susan: Mm. Hmm. And you said multiple vendors, so different cell phone companies have different antennas. Is that right?

Louis: Yes most companies have their own however, in some cases, they lease antenna space so there could be as many as three vendors on a particular antenna. It doesn't happen very often, but it can happen just to save space.

Susan: So, unlike the telephone company, because my understanding of the ground or wired telephone system is that it's kind of a network that is used by everyone. I don't know if that's...

Louis: Yes. Everybody uses the wired telephone.

Susan: Mm. Hmm.

Louis: In fact, the cellular telephone system ends up using the wired telephone system.

Susan: Oh, really.

Louis: These are ways of getting the radio frequencies out to the cell phone itself.

Susan: So, from the cell phone to the tower and then it might go wired the rest of the way or to another tower to another person's cell phone.

Louis: Correct. And it's just a regular telephone system behind that.

Susan: Does that cell phone network then, extend around the world? Or does it depend on the kind of cell phone you have?

Louis: It depends on what kind of cell phone you have. There are different radio frequencies; protocols as you might call them. One is called GSM, which is used more globally, one is called CDMA, which is used locally, in the United States, mostly, and there is TDMA. There is also an old analog style. GSM is the one mostly used in Europe and worldwide, but the United States is only just starting to implement it. It's coming pretty quick.

Susan: Okay, is that an issue when you go to purchase a phone? I mean, do different phones use different protocols? Or?

Louis: Yes. That is an issue that you should consider if you are planning on making trips to Europe, it might be wise to get a GSM-style phone.

Susan: Because one of the CDMA phone would not work?

Louis: The CDMA will not work and they are not compatible to each other. Some of the issues in the United States are that the GSM product has a hard time. I haven't seen very many that will change to analog when you are in rural areas. So you have to be very careful that you get the right service map or coverage area for what you're going to do.

Susan: So, we've got lots of different issues when you want to purchase a cell phone and also get a service provider. One of the issues, you've mentioned analog a couple of times. Analog versus digital?

Louis: Yeah. Analog is the old, I believe the acronym is AMPS, and the old analog method is still in place and that's the way that you get coverage out in the rural areas.

Susan: Outside the cities?

Louis: Outside the cities where the digital technology hasn't reached yet.

Susan: Okay.

Louis: So that's a consideration if you are living somewhere way out North and West.

Susan: If you've got a cabin out in the country or something, you might want to have an analog phone.

Louis: Correct.

Susan: And I know we have some phones here. Well, some of these phones are analog and I think this one here is an older phone.

Louis: That's a very old analog phone.

Susan: Mm. Hmm. But, I know that you can get newer analog phones as well.

Louis: Yes. And some analog phones again, you can also buy a digital technology phone that will also do analog at the same time, or dual mode.

Susan: So you can purchase phones that will do both. Do we have any here that do that?

Louis: I don't believe so.

Susan: Oh. Okay. But you can purchase one that will do analog and digital. You can use it both in the city and out in rural areas as well.

Louis: Yes. Yes.

Susan: Okay. I just wanted to look at this. How old is this phone?

Louis: That one, I believe, is from 1992.

Susan: Just to point out the change and this is a brand new Samsung phone and you can see the difference between the size here. Things have changed a lot in the last thirteen years, excuse me; eleven, ten, ten-eleven, years.

Louis: Yes. Everything is miniaturized.

Susan: Okay, now, does analog also have a greater range?

Louis: Yes. It does have a greater range but there are still some limitations as far as how far away from the tower you can be. The older phones had a lot more power associated with them. The newer digital phones don't have as much power, but the range has been reduced.

Susan: Okay. And that's, of course, why they work so well in urban areas, because you have the towers more frequently together.

Louis: Yes.

Susan: Other than analog/digital you have to consider the protocol. Now, is that something that you consider with just the phone or also with the service provider that you have?

Louis: The phone you purchase... Usually people purchase a phone and a service at the same time and then it will be matched. But if you buy a GSM phone you must get another... If you are

going to switch vendors you need to switch to a vendor that provides a GSM network. The phones are not compatible and there is no way to change them from GSM to CDMA.

Susan: Okay, so you can't get a phone that will work both in Europe and the U.S., can you?

Louis: Except for GSM.

Susan: Oh, because GSMs do work in some areas of the U.S.?

Louis: Correct.

Susan: Not in all?

Louis: They work in the major cities but they haven't deployed in all the rural areas as far as the other technologies.

Susan: Okay. While we're talking about providers and ranges, we have a great website that you found, don't we?

Louis: Yeah, there is a website that provides people with information as far as how to pick up phones, some comparisons and also gives pretty good coverage maps. There is also a very good glossary in here for terms that people throw around or the vendors will throw around. And it also has information on new third generation digital technology for cell phones. And that's coming later this year. Probably in the December [or] January time-frame.

Susan: So things are moving along quite quickly. We're looking at cellularnews.com. And, yeah, let's take a look at these coverage maps.

Louis: This is a pretty good site. They'll show you coverages for the entire world.

Susan: Mm. Hmm.

Louis: And if we were to select into the United States, it will list what style of network each vendor has.

Susan: Mm. Hmm.

Louis: You can select on a vendor or you can select on the area within the United States that you want to view.

Susan: Mm. Hmm.

Louis: And in this case...

Susan: Now it's got a map of Minnesota right here. This is great.

Louis: It'll show you a map of Minnesota. This actually has three different vendors. Sprint, Voicestream and Singulair.

Susan: Mm. Hmm. I can see they have very different ranges. And it looks even like there are some areas that are not currently covered.

Louis: Yeah. And this does not have every vendor's site. It does not have T Mobile. It does not have Nextel. So there are other vendors. And it does not have... AT&T and Quest have their own maps as well.

Susan: Okay, so most vendors will give you an idea of what their range is, but this is a nice place to compare between them.

Louis: This is a great website to go to just to get a general idea. But if you're looking at a vendor, specifically, you should go to their website and preview their actual coverage area. And they are updated all the time because they are always adding new radio towers.

Susan: Isn't it something? There are lots of changes in the last ten years and the changes keep on coming, don't they?

Louis: Yep.

Susan: Okay. Let's look at some more cell phone models. We've got the range and the protocol and the different service provider, but we also want to consider...I know there are all sorts of features with cell phones these days.

Louis: Yes.

Susan: Now this one, I know, I wanted to talk about briefly. This is a digital phone, right?

Louis: That is a digital phone by Nextel. The great feature about that phone is: people are in the construction areas and people want to get a hold of folks; there is a direct-talk capability. It works just like a walkie-talkie. And it works very well for those kinds of applications.

Susan: And the advantage of that is that you don't actually have to pay for that call. Is that correct?

Louis: Many of their plans include free direct talk. And I heard that they recently went to nationwide direct talk. So you could potentially talk to somebody walkie-talkie style from Minnesota to San Francisco.

Susan: Mm. Hmm. And with the walkie-talkie style, I basically...Would I have it preprogrammed in here and then I'd beep someone, or?

Louis: Yeah. There's preprogramming for who you'd want to attach to. There is a small address book and you can...nearly a rolodex in there that allows you to direct talk to anyone within your call group.

Susan: Mm. Hmm. And their phone would beep, and I don't want to give the impression that it would sound like a walkie-talkie, it would still sound like a cell phone conversation.

Louis: It sounds like a cell phone, but it's only one way. Only one person can talk at a time, just like a walkie-talkie.

Susan: Absolutely. That's a neat feature, particularly for people who are using it for business-type uses like that. This phone is for particular uses as well.

Louis: That phone is the Virgin, it's made by a service provider called Virgin telephones.

Susan: Mm. Hmm.

Louis: They provide a pay as you go plan. It's great for teenagers who talk a lot and you want to maintain some control on what they're doing. And that works very good. It also is a very inexpensive phone and if it gets lost it can't get abused if it is picked up.

Susan: So this is one of those phones that you purchase along with the service?

Louis: It is a little more expensive in air-time, but it does allow them to make emergency calls and do pay as you go so that it's an easy way to control what they're spending.

Susan: Absolutely. And in order to pay as you go, you pick up...It's a phone card isn't it? That you can pick up from all sorts of standard stores.

Louis: You can pick up a phone card, you can set up an account with the company, and then you can actually put more minutes on it right from the interface; from the phone itself.

Susan: Great. It's a great thing for parents to consider. [There are] all sorts of features in a lot of the newer phones. I just love this little guy here. This is one of the cell phones that has, well, it has a clock built on the front, but it's also got a little camera in here doesn't it?

Louis: Yes. The newest phones have...The newest services have cameras and email capabilities.

Susan: And chat as well.

Louis: And chat. There is text-talk capability that a lot of people like doing. It's pretty nice. The cameras work pretty well. You are probably not going to find a high-quality camera in most of these, but they do really well for basic pictures.

Susan: Absolutely, and so this is for the kind of thing that you'd put up on a webpage or you'd email to someone, so it's a very low resolution picture.

Louis: Yes. And you can email it right from the phone. So, it is very easy to send from the phone to a target email address and it works very well.

Susan: Great. Lots of fun with this one. Now I know that there are new features coming out. What are some of the latest things that are happening with cell phones these days?

Louis: The latest thing with cell phone technology is that there are new technologies to increase the bandwidth, or the speed at which you can attach to the internet. And those are coming in what's called a third generation cell phone technology. And they are still consulting on which way they want to go with that. But new devices that are coming out are personal desktop assistants, or PDAs. And those will be allowing you to directly access the internet, use a web page, use it as a cell phone. There is a company called Handspring which is just like a palm pilot. And they have a cell phone-like device but it also has a webpage built on it with a regular keyboard. It is a very small keyboard, but it is very nice.

Susan: So, you can browse the web and talk to people all with the same device.

Louis: Pretty much. And I think that you can get attachments for other features such as, GPS—global positioning—and other attachments for cameras as well. It is the way everybody is going right now.

Susan: So, we're going to have these tiny devices that can fit in our pockets and can do just about everything as far as connecting with other people.

Louis: It seems like the technology will change about every six months and new features will come out as the services improve.

Susan: But the biggest thing is connecting with the internet and increasing that bandwidth.

Louis: That's the latest rage. The big thing now is the competition between all the vendors is really driving the price of the airtime down.

Susan: Now, speaking of the price of airtime, what about the price of cell phones. We haven't really touched on that at all.

Louis: Cell phones range, depending on which service provider you sign up with, sometimes a service provider will provide you with a phone for free with certain rebates. Generally the phones go for \$50 all the way up to about \$500.

Susan: Depending on what features you get.

Louis: Depending on what features; if you are going to get a PDA, the PDA I spoke about I believe was about \$500 to \$600. Most phones, right now, that are of high quality are running about \$200.

Susan: Okay. And I would presume that the biggest issue with choosing a phone, choosing a vendor is to shop around?

Louis: You definitely want to shop around for your personal needs: your coverage; where you're going to be, are you going to be traveling within the United States? Make sure the coverages are there. But if you're going to be doing any long driving, GSM does not have good conductivity between some areas. So if you are going to use your cell phone to go driving across the United States, there'll be some spots that are not open for GSM right now. For TDMA and CDMA, they are pretty well established. Analog is very well established, but it's probably going to be eliminated after a few years.

Susan: Okay, so this is just a starting point for people. They really need to do the research on this not just listen to the hype of any one particular one company, but figure out what their needs are. As far as coverage, as far as how they want to use the phone and what extra features they need.

Louis: Yeah. They should also make sure that they evaluate the return policy of the vendor. If you get a phone that you don't like, or you get it home and it doesn't work, most vendors that I've researched have about a fourteen-day return policy so you can return the phone if it's in good shape and turn off the service and pay for the service up to date. So that's a nice feature. You wouldn't get into a phone, a contract--long term--without that; without a way to get out of that contract.

Susan: Wonderful. Thank you very much, Louis Hammond, for being with us today.

Louis: Thank you for having me.

Susan: There is no doubt cell phones have given us a freedom we never had before. We can walk across the room, converse during our backyard barbeque or consult in our cars.

Carol: Hello. This is Lieutenant Governor and Commissioner of Transportation, Carol Molnau.

Susan: Hello Lieutenant Governor Molnau, this is Susan McKinnell with Tech Talk. We're doing a program right now on cell phones. Yes. More and more people seem to be using their cell phones while driving in their cars. How do you feel about that?

Carol: Crashes that are occurring today, most of them, as a matter-of-fact, especially in work zones, are caused by inattentive driving or tail-gating. And one of the main reasons for inattentive driving is the use of cell phones, particularly when you have to hold them in your hand. And inattentive driving; if an officer sees them not paying attention to the roadways, they can be ticketed for that. And another thing that happens when people are on the phone, especially for long periods of time while they are driving is they no longer see the cars to the right or to the left of them, they may be looking pretty narrowly down the roadway, but not paying attention means they, not only do they end up tail-gating, but they end up not always seeing the lights in front of them until they've done some damage. I do not usually talk on the phone. If I do it's very brief and I use an earpiece so that I don't have to hold the phone in my hand. But if I do get a call

that takes time for me to respond, what I do is, I take the exit, wherever I am and get off to a parking lot or somewhere where I can hold that conversation and give my attention to the conversation and not try to deal task on this one.

Susan: Well, Lieutenant Governor Molnau, thank you very much for your thoughts.

Riding in cars and talking on the phone, no matter what you think of it, is just one aspect of our lives that has been changed by cell phones. This is University of Minnesota Art History and American Studies professor, Karal-Ann Marling. You know her best as the author of a number of books on popular culture, The Colossus of Rose, Graceland, and the story of the Minnesota State Fair, Blue Ribbon. She is also known all over America as the queen of pop culture. Professor Marling, thank you very much for being with us today.

Karal Ann: It's great to be here.

Susan: Now, cell phones really have changed the way we live our lives, haven't they?

Karal Ann: They have certainly changed our lives at the University of Minnesota. One of the first things you have to do now, in addition to handing out a class syllabus, is to say, "Please turn off your cell phone before this class begins."

Susan: Because, otherwise, the class would be interrupted. I hear the same thing when going to the theater and notifications at the movie theater as well.

Karal Ann: The cell phone and the baby are absolutely equivalent at the movies today as annoyances.

Susan: (Laughs) Absolutely.

Karal Ann: In addition to being an annoyance, I think, the cell phone also imposes people's lives on others in a very, kind of, interesting, but now always terrific, way.

Susan: Mm. Hmm.

Karal Ann: I always think about sitting one night having dinner by myself at a chain restaurant, that will remain nameless, and the man in the next booth had a cell phone and he was literally screaming into this cell phone, the details of his recent vasectomy.

Susan: That's not necessarily what you want to listen to.

Karal Ann: It really didn't help my chicken dinner go down at all.

Susan: (Laughs) Yes. I've heard lots of private conversations, overheard on the bus, overheard walking down the street.

Karal Ann: I begin to wonder, in my cynical way, if these conversations are real or imaginary. And that is, are they encouraging a kind of soap opera in real life drama that's being enacted around us. The other thing I find kind of fascinating about cell phone usage it that it's so constant, particularly among young people; University age. I think to myself how sad that is that our contacts need to be, in a sense, long distance. That here are perfectly nice students sitting with one another as total strangers but their contacts are always with somebody on the other end of that electronic device.

Susan: They're somewhere else.

Karal Ann: Yes. And in a way that, I think, is safer than turning to the person next to you and saying, "Hi there. I'm from Roseville and I'm pleased to meet you." I worry about that because it seems to me that the use of computers has already begun that isolating strain in American culture and I don't have any particular against cell phones, I guess. But I find it, kind of, culturally not a great thing.

Susan: Now, of course I am sure there are some young people who would say, "I'm always in contact with my friends. I can always reach them."

Karal Ann: That's true. And my students will often times will call me on the phone, too. And I know they're right downstairs. And I think that's what I object to. Why can't we have face-to-face contact? Why can't we shake hands or sit down and have a cup of coffee? I think often times we're missing a whole lot of what I'd call the human experience by using electronic devices to communicate. When cell phones first came out, being an old fuddy-duddy, myself, I was absolutely convinced that everybody who had a cell phone was sort of furtively standing outside stores talking into them; were either drug dealers or perhaps ladies of the evening making terrible contacts. But now I've begun to see them as merely sad; not criminal. (Laughs)

Susan: (Laughs) Of course, cell phone use is so ubiquitous these days it seems that a vast majority of our population has them and uses them all the time.

Karal Ann: That's true and I think in cases of emergencies, I actually bought one of these infernal devices when there was illness in my family. And they were a wonderful way of making sure you weren't out of touch when you needed to be. And I also believe that many people buy cell phones today because it's cheaper than having a land line installed.

Susan: Absolutely.

Karal Ann: So the culture of people who are anywhere up to 25 years of age and don't have a home in the suburbs yet; that is exactly the culture of the cell phone.

Susan: And you do see these people who are not getting a land line, they are just using the cell phone.

Karal Ann: Right, because it's a whole lot cheaper. There is a lot less hassle and they're also extremely cute.

Susan: (Laughs) They are very decorative aren't they?

Karal Ann: I think the design has a lot to do with it as a quasi-art historian, I always think about things like that. The idea that they are miniaturized makes them into kind of pets. They are tiny. You can take pictures with them. Goofy pictures if you like.

Susan: They accessorize.

Karal Ann: That's right. I was teaching in Poland on an exchange program for the U a couple of years ago and of course there isn't a land line that's been installed in Poland in the last twenty years. So I rented a cell phone. And I don't know why, but the man at the cell phone store where my Polish is less than perfect, rented me a Russian cell phone that was the size of a large attaché case. It wasn't cute at all. But I think as a sort of a prank, instead of ringing, it played the star spangled banner. So there I'd be...

Susan: (Laughs) Oh that's amazing. Professor Marling, thank you so much for being here with us today.

Karal Ann: It was a pleasure.

Susan: We've covered quite a bit of cell phone territory today and communicated a lot of pertinent information. We selected some of the information that our guests provided For Your Files.

Louis Hammond gave this definition of a cell phone:

Louis: Basically, a cell phone is a radio phone or a radio that talks to an antenna. And all you are doing is staying within antennas within a certain range. And then, there are multiple antennas that make up a network of cell phone technology.

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Yeah. Analog is the old, I believe the acronym is AMPS, and the old analog method is still in place and that's the way that you get coverage out in the rural areas.

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Louis: Outside the cities where the digital technology hasn't reached yet.

Susan: A web site with even more information is cellularnews.com it includes...

Louis: ...how to pick up phones, some comparisons and also gives pretty good coverage maps. There is also a very good glossary in here for terms that people throw around or the vendors will

throw around. And it also has information on new third generation digital technology for cell phones. And that's coming later this year. Probably in the December [or] January time-frame.

Susan: The bottom line, Louis says, is figure out your needs, do your research and...

Louis: Yeah. They should also make sure that they evaluate the return policy of the vendor. If you get a phone that you don't like, or you get it home and it doesn't work, most vendors that I've researched have about a fourteen-day return policy so you can return the phone if it's in good shape and turn off the service and pay for the service up to date. So that's a nice feature. You wouldn't get into a phone, a contract--long term--without that; without a way to get out of that contract.

For more information about this and future Tech Talk episodes check out our website at www.techtalk.umn.edu. If you have a question about the program you've just seen, post it on our website and we'll get you an answer. And if you have an idea for a future program let us know that too. Thank you very much for watching and until next time, I'm Susan McKinnell.

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