

Tech Talk Episode 201: Buying a Computer

A man searches among the bookshelves at what appears to be a library. The sound of a clock ticking can be heard. He locates a book titled *Electronics* and opens it to the table of contents where he points to chapter five, titled, "Buying a Computer."

The TechTalk introduction plays.

Susan McKinnell: Hello and welcome to TechTalk from the University of Minnesota; your source of information on the technology that surrounds us all. I'm your host, Susan McKinnell. And just like that man at the beginning of the program, we're going to learn what to know when buying a computer; what to look for, what to look out for, as well as a lot of definitions: bits and bytes, ROM and RAM, in other words, a computer-buying mini-course.

Among the tech terms you'll hear defined today are: footprint, memory, RAM and processor. When you think about buying a computer, there are some basic questions you need to ask. Simin Hickman, the director of the University of Minnesota's Technology Support Center is the one to answer them. For 24 years she has been providing technology support to all areas of the University. Simin, thank you for being with us today.

Simin Hickman: Thank you.

Susan: My first question: What is it that people need to think about, first of all, when they are looking for a new computer?

Simin: The very first step in determining what computer to buy is to decide what you are going to use this computer for. And what we normally recommend to people is to begin making a list, a list of why you are buying this computer, what products you are going to use this computer for, and then going out and checking the software that will perform the tasks that you are looking for. Most vendors, most software vendors, provide you with information about the product and the minimum configuration that is needed for that product.

Susan: The minimum needs of the computer.

Simin: The minimum computer needs of the computer. And so if you look at the packaging that the vendors provide they will tell you what computer it will run on and so that's a very good start. You need to know what the computer is used for and make sure that the applications that you are looking for can run on that specific configuration that you are planning to purchase.

Susan: Now, when you talk about applications, perhaps one person might want to write mainly letters or email, another person might want to go into something like video editing for family videos.

Simin: That's correct and so depending on what you are doing, the configuration of the computer will change. If you are a basic computer user, if you are buying a computer just to do word processing, maybe today, using it for email, well, you don't need the top of the line computer. You will need a basic computer and that will cover all your needs. If you are looking at maybe developing multi-media products, you're going to, these days, buy a camera and want to download images from your digital camera, or video camcorder, well, of course then the basic computer will not meet your needs. You will have to change the configuration of the computer and maybe even buy a computer that has a faster processor. So again, that step of defining your needs and finding the applications that will perform the tasks is the most important step in buying a computer. Many people go out and buy a computer and then decide what they want to do with it and find out that it can't perform the tasks that they are looking for.

Susan: And that's very frustrating.

Simin: So, we need to reverse the process and figure out the needs, figure out the applications and then find a computer that matches those needs.

Susan: Now with that comes too, whether, if they currently have a computer, whether they really need to get a new one.

Simin: That's correct. Again, depending on application and depending upon how old the computer is, it may or may not work with the application that you are looking for. So, again, if we go back to the graphics needs, through doing digital photography and if you want to edit and modify images, you will need a computer that has more memory. So in some cases, it's just upgrading your machine to have higher memory, bigger hard drive, remember that graphics images will require much larger storage space than do text files that you create with your word processor. So if you are working with applications that require higher memory, you will need to up the memory and that, these days, is not a big problem and not very expensive and so it's an easy task. But if the application requires a faster processor and your machine is old then you might actually need to buy a new computer.

Susan: And sometimes with the newer applications or newer programs, you also might need a new operating system—a new platform.

Simin: That's correct because many newer applications will not run on older versions of operating systems and if you were to switch to a newer operating system, it probably will not run on an older machine.

Susan: Now, just to back up, operating systems—we're talking about Windows, say, Windows 98, Windows 2000, Windows XP...

Simin: ...And Macintosh operating systems, you know, versions 8, 9, and today's version 10.

Susan: And also with that comes along as well whether the applications you are looking for will run on either Windows or Macintoshes.

Simin: That's correct. That's a very big issue, I think, people need to keep in mind that although many of the major vendors, today, either have applications for both platforms, many products will not run on both Macintosh and PC-compatibles. So, again, go back, figure out what applications you want to use, make sure it runs on the machine that you have in mind and then purchase a machine.

Susan: I know that I've seen specific genealogy software that something a lot of people are very interested in that only runs on one or the other.

Simin: That's correct. So it is very important to know what you are going to use your computer for.

Susan: Great. Now what are some other things that we will need to consider? I know one of my big issues is whether to get a laptop or a desktop.

Simin: Well, laptop/desktop, it's really a very personal choice. I always compare it with buying a car. You know, I may want to buy a convertible—what I'm using it for—it meets my needs better than an SUV. So it's really a personal choice. But there are a few things to keep in mind. When you are looking at purchasing whether it be a desktop or a laptop keep in mind that desktop computers are more stationary. You have to go to them, you have to go to it, you have to go to the computer, the computer is in an office, if you want to use it, you have to go that office and use it. Whereas the laptop, provides you the portability, the option to use the same computer, the same applications and take it with you from home to office, on the airplane, to the hotel and today, in many homes, we do have access to wireless computing. You can take it from room to room, floor to floor; you can sit in front of the television and while you are watching a program, still send email to your friends or write a document, or if your children are using it to write their paper, I know many children like watch the computer while they are doing their homework. A laptop provides that option.

Susan: I wonder how much they can get done. But, there are some down sides to the laptop too, though, aren't there?

Simin: Well, the down sides really are lack of options for expandability. The desktop has more options for expanding the computer—adding adapters to it, adding other peripherals to it. The laptop is, in that sense, more limited because you have a smaller box and it doesn't have room for adding a lot of other adapters to it.

Susan: Mm. Hmm.

Simin: The other downside, for some people, is the size of the screen. On a desktop you can buy very large screens, especially if you're manipulating data that requires to be moved from one screen to, or, one window to another window. A larger screen provides the option of opening several windows at the same time and moving information from one window to the other. Whereas your laptop, although today's laptops have larger screens, it's not as big a screen as can have on a desktop.

Susan: Getting screens, as well, I know there are different choices for monitors.

Simin: Well, there are and, I think, just like television, you do have the option of going with the flat panels today. You can buy really thin, very nice, high-resolution monitors, if you are able to continue using the older monitors that take up a lot of space, you can buy them for very little money. They have become a lot less expensive. The flat screen monitors are much nicer but still in the higher price range. So, you have to evaluate what your needs are. You have to also evaluate where you are going to use the computer and the footprint, the space that you have available for setting up your computer.

Susan: The footprint is how much space on the desk that a computer actually takes up. I do want to clarify a little bit some of terms too, when we are talking about a monitor, that's what you see with the screen, but it's not actually the brain of the computer, so to speak.

Simin: That's correct. That's just how you display the information that you are using, that you are manipulating in your computer and depending on how big an area you need, you may want to consider a bigger monitor or if you don't care and you are just word-processing email, then, of course, the laptop screen is just fine. You know you can buy a 12 inch, 10 inch, 14 inch there are bigger screens now available for the laptops also.

Susan: Sometimes, particularly if you've got eye issues and so forth it's nice to have the large screen.

Simin: Exactly.

Susan: Brand names. What are the considerations with brands?

Simin: Well, the most important consideration is support. So when you are looking at computers that are from manufacturers that are well-known, have been around for a long time, you have a higher chance of getting better support from them. Bigger name brands probably provide you with a better warranty for you machine. You don't want to buy a computer that is here today and gone tomorrow and if something breaks, you're stuck with not being able to get support for it.

Susan: Some things break on computers, unfortunately.

Simin: Absolutely, even the best of them occasionally break or crash. You want to be able to get support, so I'm not saying you have to buy the absolute most famous brand names in the market but, you probably will do better if you buy brand names that have been around and you think are going to be around for a while.

Susan: You don't want to go with something that you've never heard of before.

Simin: Absolutely. Absolutely. It's a good choice not to go with an unknown brand name.

Susan: Well, thank you so much for being with us today, Simin. You've given us lots of wonderful information.

Simin: Thank you.

Susan: Now that we have a good base of information, let's get down to some of the details; things like bits, bytes.

A man juggling ping pong balls appears on the screen. A voice is heard saying...

What's a man juggling ping pong balls got to do with a program about buying a computer? Well, those are no ordinary balls, those are bit balls. And they're going to show you the difference between bits and bytes. Let's say that ball is a bit, in tech terms a bit is the smallest unit of information on your computer. A single bit can hold only one unit of information—a one or a zero. All the data that a computer processes is just a series of zeros and ones. Now it takes a lot of bits to process and store the information on your computer. And adding all those bits together creates huge numbers, so they've created a way to make those numbers more manageable. They take eight balls—eight bits and put them together and make one byte. So, eight bits makes up a byte. A thousand of those bytes makes up a kilobyte, a million bytes makes up a megabyte and a billion makes up a gigabyte. The more bytes a computer hard drive has, the more information it can store. And then there's something called RAM. Simply put, RAM is the temporary memory your computer has to perform the necessary tasks when the computer is working. The more RAM, the more things your computer can do at one time. Another term you'll encounter is hertz, as in kilo, mega and giga—hertz. It's a measure of how fast your computer can process all those bits and bytes. An early computer with a kilohertz speed was pretty fast for its time, but a computer with a megahertz speed is a thousand times faster than that and a computer with a gigahertz speed is a thousand times faster than one rated megahertz. So, definitions for bits, bytes, RAM, and hertz.

Susan: But what about the other things we should know, like what's inside the computer? To show us that, here's Nathan Hemming. Nathan is a technical specialist for the U's computing services division. He also works with 3-Dimensional computer models and data analysis in the University's bio-systems and agricultural engineering department. Nice to have you with us, Nathan.

Nathan: Thanks for having me.

Susan: Now we've got a lot of stuff here. My first question is, I always think about the hard drive as like an integral thing in the computer. Can you show me a hard drive?

Nathan: Yeah. The hard drive is one of the most important parts of the computer and what I have here is the hard drive. The hard drive is like a filing cabinet that you have inside your computer. You store your files in here. This is not what memory is called, we'll talk about that in a moment. But this is the part that you see in a computer ad that would say 40 gigabytes or 80 gigabytes or something along those lines.

Susan: It's usually in gigabytes, big gigabytes these days.

Nathan: Yeah. They hold a lot.

Susan: Okay, so when I save something, it's going on the hard drive.

Nathan: Anything you save is on your hard drive. All of your programs are stored on the hard drive and any data you have, email and things like that are stored on the hard drive.

Susan: And just to take a look at what we have here, we have one computer that's open and then some duplicates of objects. The hard drive is somewhere, it's actually kind of buried in back of some objects right here. And this is an older computer, so newer computers might have things in different places.

Nathan: Right and each vendor will be slightly different inside.

Susan: I also probably should mention at this point that you don't really want to open up your computer like this and start pulling things out. This is just for our demonstration purposes in this show. Okay now, you mentioned memory a second ago. Now that's not the same as your filing cabinet.

Nathan: No. Memory would be like space you have on your desk. And what I have here is a piece of memory called a dim. It fits inside the computer and basically any program you start on your computer, anything that you are working with, gets taken from the hard drive and put into memory while you are working with it. Memory is usually one of the cheapest upgrades you can make to a computer and it really is one of the things that helps your machine perform better.

Susan: Now you just compared it to a desk. We've got a filing cabinet for the hard drive and the memory is like a desk, so that's like my work space?

Nathan: Basically, yes. If you have a lot of memory on your computer, you have a lot of space to do work with your computer while you have files open, programs running.

Susan: You can have more files at one time.

Nathan: Right. If you have 512 megabytes, for example, versus 128 you will be able to work with more files and have more programs open with a larger amount of memory.

Susan: Okay. Great. And the memory in this computer is right down in here and those are called sticks, right?

Nathan: Yes. Right.

Susan: And we can see that there are a couple slots here, so this computer could have an upgrade.

Nathan: Right. Most computers are upgradeable; they have between usually two and four slots on the motherboard that you can put a memory stick.

Susan: And that's one thing to look at if your computer is not, as Simin said earlier, you might want to think about upgrading a little bit. Upgrading the memory is probably the first thing.

Nathan: Right and it's the first thing and it's usually one of the more inexpensive things you can do and it's one of the things that will give you the biggest performance increase versus upgrading a processor or putting a bigger hard drive in.

Susan: Okay, now processor. We're talking about speeds with processors too. That's where we get into the hertz, right?

Nathan: Yeah. Processor speed is usually measured in megahertz or gigahertz. What I have here is a processor and this is a fairly old one. But the processor connects to the motherboard on your computer and is what processes data, it takes the instructions from the hard drive and converts them into things that you can...; it does the processing work and processes them into things like graphics you can see on your screen.

Susan: So if we've got a fast processor our computer can basically think faster, is that what the idea is?

Nathan: Basically, yes.

Susan: Okay.

Nathan: But the processor can, if you have a fast processor and not a lot of memory, the processor, won't be able to take advantage of its full speed if it is hampered by having no memory.

Susan: Okay. So the two kind of work side-by-side?

Nathan: They work side-by-side, yes.

Susan: And then here I think we've got a different processor, right here. It's a different model of it.

Nathan: Right. I think that's a Celeron processor there and we have a Pentium processor here.

Susan: Okay. And these look kind of big. The processor itself is kind of buried inside there.

Nathan: Yeah. The processor is typically very small. You can see the big thin array on the back of it which is called a heat sink and a processor generates a lot of heat while it's working because there are so many small electronic parts put into one small area. So a lot of heat is generated and so your processor doesn't burn up they put a heat sink on the back to remove all of the heat generated while it is working.

Susan: Partially why we've got a noisy fan in our computer too.

Nathan: Right. Exactly.

Susan: Great. Now what's this big thing right down here?

Nathan: This is one of the most important parts of the computer, it's called the motherboard. This is where all of the components plug in. There are slots for memory over here, there are slots for expansion cards like video cards and sound cards and usually there are ports on the back to connect things like keyboards and mice and things like that. This processor or this motherboard happens to be out of a Mac computer, so it has a different processor...

Susan: Macintosh or apple.

Nathan: ...built into it. But you can see this one has four memory slots that you can put up to four memory sticks into it and it also has four slots that you can put interface cards in.

Susan: Now you say sound or video, I mean my computer can show video...

Nathan: Right and you could put a card in to collect video from a video camera or DVD player or something along those lines.

Susan: So, Okay even though it shows video on the screen I might need to have something else...

Nathan: You might need something else to bring video into your computer to home video editing or something like that.

Susan: And most computers come with some sort of sound built in.

Nathan: Yeah, most computers now have built-in sound capabilities so you can listen to music or CDs or something like that as it comes out of the box from the factory.

Susan: We mentioned briefly with Simin the two different platforms Apple and excuse me, Macintosh and Windows, but Windows are made by a lot of different companies.

Nathan: Right.

Susan: Whereas Macintosh are just made by Apple computers.

Nathan: Correct.

Susan: I wanted to look at, I have a copy of an ad in here and I thought it would be great to take a look at it.

Nathan: Sure

Susan: Because people find when they go to these stores, they look at these ads and they look at all the numbers and everything and it doesn't, even though we've looked at this stuff, it doesn't seem to make much sense. So I was wondering if we could kind of deconstruct this a little bit.

Nathan: Certainly.

Susan: So we're starting at the top up here and it's talking about the Intel Pentium 4 processor. So we've got the processor here, this is a Pentium as well right?

Nathan: Right.

Susan: And you talked about this was a Celeron, you said?

Nathan: That is a Celeron, there, correct.

Susan: I've seen different kinds of processors being talked about.

Nathan: Right. In Windows-based computers or PCs, usually there are three different kinds of processors that you can get. There's the Intel processor, usually a Pentium, or a Celeron and then there is also the AMD processor is the third kind.

Susan: Okay.

Nathan: They're all compatible with one another. They all run programs the same way. It's just that each processor has a different price, basically and it's installed in different kinds of machines.

Susan: Is there one reason why I'd want one kind over another?

Nathan: If you are doing a lot of very sophisticated work, if you are doing digital video editing and things like that, you probably would want to go with one of the faster varieties; the faster AMD processor or the faster Intel Pentium processors. The Celeron processor is a more basic processor but it will still be more than adequate if you're doing things like word processing and email and web browsing.

Susan: Okay and I've got the speed of the processor that the 2.8 Gigahertz, right?

Nathan: Right.

Susan: That's the GHz here. Now and sometimes older ones are in Megahertz, right?

Nathan: Right.

Susan: We're into Gigahertz now, we're getting fast. So is it more important for me to look at that number than what the actual name of the processor is?

Nathan: Usually, yeah. If you look at the speed of the processor, that will tell you a lot about how a processor is going to perform. If you look at a processor that is 1.6 GHz, in all likelihood it is going to perform slower than say a 3.06 GHz machine.

Susan: Okay. We're throwing out the numbers here, these numbers change all the time right?

Nathan: Definitely.

Susan: So a week from now we might be talking about 5 GHz. Who knows?

Nathan: It's always changing.

Susan: So it's a comparison and you go with...if you need top-of-line you go with faster and...

Nathan: Right. And basically, like Simin said, buy a computer based on the uses you have for it. And if you you're doing basic things, you can get by with a slower processor and your experience with the machine won't change any.

Susan: Great. Sounds good. And again she also mentioned looking at the applications and seeing what the needs were on the application. The application will state what it needs and then you can look at the computer and see if that fits the needs.

Nathan: Exactly.

Susan: Okay. A couple of other things I want to look at here. This one it does say that it is Windows XP, so that's the operating system.

Nathan: Right.

Susan: Okay. And then it says it's 256MB of SDRAM.

Nathan: Correct.

Susan: What's that?

Nathan: SDRAM is the type of memory that uses...

Susan: But the RAM part is the memory.

Nathan: Yes. The RAM at the end means it is the memory and that goes back to this DIM that we looked at before. And 256 MB references how much there is and that's usually the most easily upgraded portion of the computer that you have.

Susan: As you mentioned earlier, and again that's how big our desk is, how much we can do at one time.

Nathan: Right. And if you are doing basic computing—word processing, browsing the web—this advertisement says this machine has 256 megabytes in all likelihood that will be enough for what you are going to do. If you are going to getting into video editing or sophisticated sound work then you may need to have more or a lot of digital photography, more is always better for that.

Susan: Okay, okay, sounds good. And then we've got our 40GB as you mentioned the hard drive is always measured in Gigabytes.

Nathan: Right.

Susan: A couple of other things. It mentions a DVD ROM drive. We haven't really talked about other drives.

Nathan: No, we haven't and the important thing to remember with a DVD ROM drive is that it is backward compatible with CDs. So you could install applications from CDs. Or you could listen to music from CDs.

Susan: And you can also use DVDs.

Nathan: Right. You can also watch DVDs or install software from the newer DVDs that are coming out. The important thing to remember with it being a DVD ROM drive is that the ROM at the end means Read Only Memory. So you won't be able to record CDs or

DVDs with this drive you need to have a different kind of drive like a CD-R or a CD-RW drive or one of the DVD-R drives that have just come out.

Susan: Now, just to clarify, the R stands for...

Nathan: Recordable.

Susan: ...and the RW?

Nathan: Rewritable.

Susan: Okay. So recordable you're going to be able to record once.

Nathan: Right. And that would be typically if you were making an audio CD. If you want to write it once and take it with you in your car or something like that. The rewritable would be if want to use one disk as a backup of your computer. So that way you could make continual backups onto to the same disk over and over again.

Susan: Okay. So depending on your needs, again, you're going to figure out what kind you want.

Nathan: Right.

Susan: Thank you so much for being here with us today, Nathan.

Nathan: Oh. You're welcome.

Susan: You've given us lots of wonderful information.

Nathan: Certainly.

Susan: Let's say you already have a computer, but you want to get a newer, faster, prettier one. What do you do with the old one?

One thing you can't do is throw it away. Computers, cell phones, printers, televisions, e-waste it's called contain materials that if released into the environment could be hazardous to your health; materials like phosphor, barium, cadmium, mercury and lead among others. Individually they're only a few pounds per machine but when you add up all the e-waste tossed into landfills, it's estimated that 40% of all metals like those come from discarded electronic equipment. That's why a lot of states have outlawed dumping your computer in the garbage. But if you're one of the estimated 315 million computer owners whose machines will soon become obsolete, what are you options? Well, you could keep it or you could give it to an aid or international organization that's looking for older computers or you could give it to a school, however, many of them want computers that are relatively current and able to runs today's programs or you could call a computer

recycler one that pays money for your old machine. Check your local city or county government, they may have an agency that recycles or disposes of old computers.

Amy Roering of Hennepin County Environmental Services:

One of the programs that we offer is our consumer electronics recycling program where residents can drop off old TV's, old computers, other electronics equipment free of charge at a facility such as this one. And then we have event collections where people can also drop off trouble materials, household hazardous waste and electronics.

And here's one last suggestion...

Amy Roering: Buy upgradeable gear so that you can just modify it slightly, upgrade to the next level that you need to so you don't have to buy, purchase, a whole new piece of equipment and you can just upgrade. That'll help reduce waste. And then, finally, you can also ask retailers and manufacturers about take-back programs, for example DELL, Apple, IBM, several computer manufacturers and television manufacturers are now starting to offer take-back programs.

Susan: Well, that's our show for today. There was a lot of information presented so here are some reminders for your files:

Simin Hickman, director of the technology support center, said there is an essential step you need to take before buying a new computer.

Simin: That step of defining your needs and finding the applications that will perform the tasks is the most important step in buying a computer.

Susan: She also gave us advice on brand names and computers.

Simin: The most important consideration is support. So when you are looking at computers that are from manufacturers that are well-known, have been around for a long time, you have a higher chance of getting better support from them. Bigger name brands probably provide you with a better warranty for you machine.

Susan: If your computer is slowing down, Nathan Hemming, technical specialist suggests upgrading the memory in your computer is...

Nathan: It's the first thing and it's usually one of the more inexpensive things you can do and it's one of the things that will give you the biggest performance increase versus upgrading a processor or putting a bigger hard drive in.

Susan: If you have a question or comment about the show, check out our website. The address is techtalk.umn.edu

What about next week?

If you haven't made the Macintosh/Windows decision yet, we're going into detail on both of those operating systems, as well as information on other software you may need. Until then, I'm Susan McKinnell.

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