[SQUEAKING] [RUSTLING] [CLICKING]

[MUSIC PLAYING]

LUIS PEREZ-BREVA: Technology isn't what you think it is. We all use the word "technology" as if it meant the same thing to all of us. But are you sure we all mean the same?

To a researcher, technology is what's on a research paper. To an engineer, it might be a prototype or a system. In government and in the military, everything hinges on requirements. Investors seem to associate technology with industries and valuations.

To an office worker, it is the stuff we do with computers, information technology. In MBA programs, the word is used as a synonym for "product." This leads to many comical situations.

For example, at MIT, enterprising researchers in engineering or science will describe what they've invented to business students, hoping that these students will get it and will solve for the product to build. Meanwhile, the same business students, eager to work with technologies, are hoping for the precise opposite, that the researcher will have figured out the product already so they can wrap a business around it. They all use the word "technology," but they mean different things, and they each hope that the other party will have done the work of figuring out where the technology fits.

The same happens when government agencies in science and technology seek sponsors to commercialize ideas or when the military seeks to transition technology to operations. In the new mindset, we think about technology differently. It is neither the product nor the paper. Technology creates options. You can reshape technology.

This should be obvious, but often, it isn't. Take lasers, for example. Today, they are used everywhere-- in presentations, to carry information over long distances, barcode readers, military, computing. We know the laser is good for many things. But years after he invented it, Dr. Maiman still called it a solution in search of a problem.

This is why thinking in products leads to paradoxes. Sure, you could interview users for the first laser, but who are they? We all hope that something about the technology will tell us what it is good for and what to use it for. But the fact is that at the start, nothing is new or obvious.

To go from that first hunch or paper to impact, you're going to have to work on and reshape what you start with. Technology gives you options. It is malleable. It can be reshaped.

Here are some examples of what I mean by creating options. These examples come from the work of students in our MIT class, and they show how one technology has led to unexpected uses, sometimes more than one.

Jeff Grossman's laboratory developed a powder that stored heat in the cold. It was meant to help increase the efficiency of solar energy concentration plants. Students in the class determined that if laced in fabric, the same technology could help create self-warming high-fashion clothing. They took the technology from energy to fashion.

Another example-- Joel Dawson's lab invented a new kind of circuit that increased battery life by about 10%. At the time, the prevalent phone was the iPhone 1. Students in the class found out how to adapt the technology to manage energy in the telephone network instead, where it saved millions and ended up founding two different companies from the same technology. Both companies were eventually acquired by large infrastructure equipment companies. That's one technology, two companies.

These examples are from my MIT class. And so they may lead you to believe that you need a technology to start. So let me give you two examples involving technologies born out of repurposing other knowledge.

The first laser emerged out of a pet project in an industrial lab. And it was produced with parts ordered from a catalog, like a photography flash lamp or a ruby crystal cut to order. Nothing was new. Everything was repurposed.

Early in my career, we created a company to locate cell phones in case of emergency. The problem to solve came to us from a new regulation from the Federal Communications Commission. We invented an artificial intelligence technology to solve the problem. However, the technology was inspired by a chemical engineering thesis.

Students often come into class expecting to find the ideal use for one technology. They learn to appreciate that one technology creates many options. This means that technology investments are made risky not by the technology itself, but by how we try to narrow technologies down to one obvious use.

So do not narrow it all to just one use. Challenge yourself to find those options. There are ways to do it systematically. In my class, students start with keeping at least three options open. Having options is convenient because, as you'll realize in the next video, real-world problems are interesting because there are many ways to chip at them. That's how technology gets you to solve problems.

[MUSIC PLAYING]