



Rouzbeh Yassini

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PHOTOS SUBMITTED

The Father of the Modern Modem

It was a futuristic life we had only dreamed of, where body sensors automatically alert physicians when your blood pressure skyrockets. College courses are completed from your living room. A webcam guards your house while you're on vacation. And a Skype call with your grandchildren lets you see their smiles, new toys, and tiny fingers as they press the end-call button.

All of these are part of the broadband revolution we have today. Right now. And all of them trace back to Rouzbeh Yassini.

The twentieth century took us to the greatest heights of information-sharing since humanity began, and broadband has been our road as we've taken our biggest steps.

Yassini, known as the father of the cable modem, is a large part of why we have this keycard to the autobahn of information.

He saw the infancy of the Internet, learned how cable is delivered, and put two and two together. It took years. It took a lot

of translation between industries that spoke different technical languages and had square pegs for round holes. But his vision guided him; a vision that existing technology could be used to take the world forward to a digital information future.

In the decades that followed his arrival to the United States from his native Iran, Yassini would take a path trod for centuries by new arrivals to America, but make it his own.

Arriving in Morgantown, WV, as a college student in 1977, Yassini chose electrical engineering because he couldn't afford medical school. After graduating with a bachelor's degree from West Virginia University, he was recruited by General Electric.

By 1986, he had left GE for Proteon, a company that produced Local Area Network equipment. Before computers were in vogue among the general public, companies used high-speed connections to share work between computers in their buildings. That was the LAN.

Yassini had this picture in his head of something more than a local network. It would be fast, inexpensive, connective. It would use existing technology. And it was possible.

For the next decade, he gathered a team of engineers to experiment and develop. By the late 1990s, an inexpensive cable modem was available commercially.

"Our inspiration came from that fact that we knew—beyond any question—that access to broadband Internet connectivity would be an agent of tremendous empowerment for individuals," Yassini said. "We recognized that personalized communication and telecommuting were tools in humanity's toolbox needed to support rapid scaling of the world population.

"We were convinced we could change the fundamental ability of people to contribute to the world through telecommuting rather than burning fossil fuel and

to be producers, not merely consumers, of content and ideas and innovation. That's a powerful motivation."

But before that was years of research and technical challenges. He says it was exhilarating and terrifying.

"For a typical technology start-up to attract capital and succeed, you really want to have only one or two serious, fundamental risks to over-

come," Yassini said. "We had five of them.

"We had to find a way to reduce the cost of a powerful

cable modem to below \$50 from \$18,000. We had to find a way to work within existing computing and video delivery standards. We had to invent technology that would cover an entire city. We had to move the implementation from the analog world to the digital platform. And we had to overcome challenges around testing cable modems that could have taken hours per day.

"But we solved every one."

The difference between being a visionary and getting something done is the long nights he spent solving engineering problems, maintaining a talented workforce, and staying true to an idea for years without reaching a final product.

"We also had something I think every promising idea needs: a team of talented people who believe in the greater purpose of what they're doing," Yassini said. "Without that it's very difficult to persevere."

This innovation was at the center of multiple, separate industries. It required knowledge of local area networks, cable, and fiber-optics. None of the industries

were on the same page and all were charting different futures.

"I think any entrepreneur is familiar with the feeling of being completely on the outside of conventional wisdom," he said. "The truth is, there were naysayers everywhere who were convinced our idea had no prayer."

Understanding the role of Yassini's work and how it affects every day lives requires going back in time to when there was no Internet as we know it.

When Yassini

began his work on the cable modem in 1986, the US government's early version of the Internet, known as ARPANET, was online, but the World Wide Web wouldn't be invented by Tim Berners-Lee until 1989 and the Web wouldn't become commercial until the 1990s.

When the common folk did start using the Internet, we used dial-up to connect. With our phone lines plugged into boxes, we listened to the bouncing tones of the magical connection that let us access our e-mail and hop on Netscape or Explorer. We could look up restaurants, colleges, businesses. And that was pretty much what we did.

There was no Skype. There were no iPads. There was no Hulu or Netflix. There was no YouTube. Then, Google was an infant in the search engine world.

But about the time we took our first real steps on our computers with elementary graphics and speed, the cable modem was ready. It was ready before the most active digital child—video—learned to run online.

Since then, information access has significantly increased in speed, geography, and

volume. Communications company Cisco says that in 2013 the amount of data shared over the Internet will be 667 exabytes annually, with most of this traffic being video. To make sense of that, only five exabytes could store all the words of every human language ever used.

Yassini hopes learning becomes a faster process for those who come after him. It takes émigrés decades to better themselves and then pass that knowledge on to those in their home countries, he said.

"I felt that broadband could change that," he said. "It was a passport to knowledge transfer like the world had never known. That's why we gave away our modem technology protocols license-free not just to the cable industry but to the world.

"We wanted our innovation to be used anywhere, anytime, any way. We wanted to give everyone the toolbox so that broadband would empower them with a personalized communication connection to anywhere in the globe, much like electricity empowered individuals in the nineteenth century."

He calls the innovation of the cable modem a beginning and an indicator of what can come from putting visions into practice.

"Entire companies, even industries, now exist because of broadband, with higher market capitalizations and contributions to gross domestic product than twentieth-century industrial giants like General Motors and GE. Most important I think is that billions of people now have a tool kit with which they can create, produce, and contribute to an information economy that offers enormous opportunity. And we can do all this without draining away our limited resources from this planet."

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