

Executive Interviews: Craig Barrett

The Importance of Global Standards

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—Craig Barrett

You are often quoted in the press, commenting on the need for global technology standards. Why are global standards so important?

When we were all nation states, independent of each other, with our own borders and internal rules and regulations, each nation could have its own technology standards. But the world is getting smaller on a daily basis. By smaller, I mean that hardware, software and content move, and they move independent of, and irrespective of, international boundaries. As that trend continues, the need to have commonality and interoperability between devices grows.

As borders become transparent, whether you are running your railroad line or your broadband connection across the border, you need to have some degree of commonality, and that's what standards ensure. Increasingly, we're not talking about physical goods crossing borders but about goods flowing through the ether. You have to have standards so that the movie made in China or India plays in the equipment delivered in the United States, or the Web site supporting Intel in the United States plays on the computer in China.

How do global standards benefit industry, and how do they benefit consumers?



When you have common protocols, interfaces, and form factors, then the whole industry can evolve around those common characteristics and innovate on top of them. Standards allow the industry to move forward without each individual company having to do the ground up implementation on its own. That's been the success model for the personal computer, and it's been the success model for consumer electronics, to a large degree. Because of standards, everyone can innovate and everyone can interoperate. Companies can build their businesses, consumers can expand their choices, the technology moves forward faster, and users get more benefit.

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Imagine what it would be like if there were a wide variety of films, standards, and sizes associated with cameras as opposed to a worldwide, international standard, and what it would mean to people if they couldn't take their cameras from one country to another because film had a different specification, a different size or a different format. Now that we've moved into the digital camera space, we're seeing a similar problem with the variety of memory cards in different formats for digital cameras. This doesn't benefit the consumer. Consumers want to have standard flash plug-in cards that can be put into any camera

or into any PC in the world so they can download their photos. So you can see the importance of global standards.

If you look at electrical standards, that's another classic example of why international standards are needed. If the whole world had gone to either 110 volts with a common plug or 220 volts with a common plug years ago, this obviously would have been better for consumers. Not having a common electrical standard in the world has no benefit to the consumer and adds cost to industry through the provision of various power cords and configurable power supplies.

What are some of the most important global standards emerging today? What should the world be focusing on?

I think the world should be focusing on the basic protocols, interfaces and interoperability standards between devices. This is prevalent in the communications area, where you see a wide variety of interfaces and protocols associated with communications devices. You want to make sure that there are common communication protocols for each class of devices.

As we increasingly see the convergence of communications, computing and content in devices, we need standards to enable this. Anytime you bring technologies from different industries together, you have areas of overlap or interface between the two, and that's where you need to have common standards. So you need to have the computer and communications industries along with the consumer electronics industry get together and decide on common standards, on the baseline architecture that will enable their devices to interoperate.



Some of the important standards to support convergence are the wireless standards, such as Wi-Fi* and WiMAX, and the wired interface standards, to allow devices from different industries to play together. You want those standards to be open, not proprietary, and you want those protocols built into the various devices.

You also want standards in areas where the consumer has some choice of where to use technology. There's a range of devices, from personal area networks up to wide area networks that have degrees of commonality. If I buy a CD or a DVD, will it play in my consumer electronics device? Will it play in my computer device? In my car? We need standards to make sure that I can use my content in various devices.

Now, there is absolutely no desire to overspecify the solution. By advocating standards, we're not trying to have one size fit all. We don't need to have every automobile in the world look the same, but we would like all of them to have some degree of commonality in the human interface. But beyond that, you want to give the various competitors design creativity and give consumers a variety of choices.

You mentioned the need for the computing, communications and consumer electronics industries to agree on interoperability standards. How do you persuade these industries, which sometimes compete with one another, to cooperate in developing standards?

That involves detailed technical discussions as well as business discussions. As for the technical discussions, you want the best technologists to sit down together and come up with the right solution — the solution that will be best for the consumer in the long term.

On the business side, you just make the simple argument that global standards expand the marketplace, making the pie bigger so that everyone has an opportunity to get a bigger slice. So it's an argument of growing the market for everybody as opposed to a market of competition between industries.

If you go back to the late 1990s, there was a perceived competition between the handheld marketplace and the computer marketplace, as to what would be the device of choice to access the Internet. Would it be your smart cell phone or your PC? This was a classic case of people focusing on competition rather than the concept of enabling devices to interoperate so they would be more useful and would create a bigger marketplace for both sides. Instead of having that discussion, the sides polarized, with each side insisting that there would be either a handheld market or a desktop/laptop market. And so sometimes the competitive instincts overpower common wisdom and what, I think, is the better long-term approach.

How much progress has been made in implementing global technology standards, and what challenges remain?

The world moves in fits and starts. In some areas there is a movement toward global standards, and in others there is still competition between standards. In some of the emerging technological areas, such as the digital home, there's been a lot of work done to promote common interfaces and protocols to ensure interoperability among various digital home devices — computers, handheld devices, and a variety of consumer electronic devices.

Perhaps the one key area where we haven't yet seen a global standard emerge is in cell phones. There is still competition for different protocols, so when you go from one region to the next, you sometimes have to get a different cell phone, one that uses the particular region's protocol. The lack of a common standard has really inhibited the interoperability and usage of cell phones globally. This doesn't benefit the consumer, and in the long term, it doesn't help the industry.

Why do some countries or geographies resist global standards, given that they are good for industry and good for consumers?

Some countries or geographies still look at local standards as a way to promote local industry, without considering the larger impact. They view the standards-setting process as a form of protectionism, in the same way that some countries use tariffs as a protection for local manufacturers. I think that in the long term, this inhibits local industry, which has to provide not only the local standard but the standard for other countries. It also makes the technology more costly to the local user, which inhibits its introduction, its spread and its usage. So by focusing on just one aspect of the system, such as trying to protect local industry, people oftentimes suboptimize the total system.

Should government play any role in creating standards?

Government needs to provide the necessary legal and regulatory framework to support an industry-driven open standards process. Government can also serve as a proxy and sometimes mediator, as it does in dealing with international standards organizations.

Beyond these roles, the basic problem with government trying to mandate standards is that technology moves rapidly. Government decision-making is much slower than the pace of technology, so any potential government initiative to impact industry through standards is always going to be many generations behind.

Open competition is a wonderful thing. Government intervention usually voids or restricts the basic competition that allows technology to move forward.

Some governments try to control the market through the use of subsidies to protect the local industry. This may work in the short term, but as with tariffs, it gets in the way of the free-market flow of goods and services. So the whole issue of free and open trade is contrary to having governments establishing artificial barriers. And that's what a government restriction on technology looks like in its worst case.

What role is Intel playing in driving global technology standards today, and how do you expect that role to evolve in the future?



Certainly in our core computing business, Intel has worked closely with industry players in the established marketplaces in driving global standards. We've probably had less of an impact in some of the developing markets, because we haven't yet established as big a presence in their emerging standards-setting bodies. So we have a good historical track record of helping to promote global standards but a lot of work to do in the future, especially as new markets come on-stream and people may try to protect those new markets through local, proprietary standards.

The fact that Intel operates throughout the world and facilitates industries in every country puts us in a good position to advocate for global standards. Our substantial investments in technology and our interfaces with other technology companies in wireless, consumer electronics, software and hardware, give us a solid base to build on. The standards bodies view us as bringing solid technology and technologists to their forums, and they highly appreciate this.

We also have a reputation for being relatively neutral, able to work with a variety of companies to create standards that will benefit the industry as a whole. We take a broad view of business and technology, and what is needed — not just from Intel but from a variety of players, both near-term and long-term, to establish industry standards. All of these factors establish us as a world-class player in the global standards environment.

About Craig Barrett

[Craig R. Barrett](#) became Chairman of the Board of Intel Corporation on May 18, 2005. He became Intel's fourth President in May of 1997, and Chief Executive Officer in 1998. He was elected to Intel Corporation's Board of Directors in 1992. He served as Chief Operating Officer from 1993 to 1997. He began his tenure at Intel as a Technology Development Manager in 1974. Prior to joining Intel, Dr. Barrett was an Associate Professor at Stanford University in the Department of Materials Science and Engineering.