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I. Entrepreneurship and Growth

Many of you in the audience today are some of the most privileged people on Earth. You work or study in one of the great incubators of entrepreneurship in the world, the Haas School of Business. Your privilege comes not just from who or what you study, but where you study. Silicon Valley is one of the greatest engines for growth and productivity the world has ever seen, and as entrepreneurs, growth will produce your sustenance. As an entrepreneur, you need growth to live, but you must also supply it. Without growth, opportunities and rewards vanish or diminish.

I'd like to talk with you today about entrepreneurship, innovation and growth, ideas that some say Silicon Valley has lost. I say they are just not looking hard enough. Today, we have a bigger and stronger foundation for growth than we've had in the 50 years since I've been aware of what the foundations for growth were. I think what we need to do is realign our expectations with a more realistic view.

During the bubble of 1999-2000, I was amazed at how many AMD employees who were very skilled and very talented had the opportunity to join some startup where they were advised that they would be worth a few million dollars in six months when the company went public. That's rather short term from my point of view. In many cases, these companies that were supposed to be going public didn't even have any revenues, much less profits. In the interest of today's discussion, I'd like to take you back just a few decades to when AMD went public in 1972. Back then, we were supposed to be profitable before we went public. Back then, the concept was that you went public so you could tap the capital markets to further grow your already demonstrated successful business. I'd like us to go back to those things, because that really is what made Silicon Valley great.

II. AMD's Beginnings

Everyone has expectations, and they're not always realistic. We went public at 93 times the most recent quarter's annualized earnings. Not bad, compared to a lot of the dotcom businesses. My co-founders however, were livid that that was the best price I could get for the stock. I remember it well because the stock opened at \$15.50, immediately went to \$16.00, and then had a steady downturn to under \$1.00 in less than two years. Talk about realizing your expectations! Fortunately, since that time we've had about 47 splits, and so those people that hung in there did just fine.

Thomas Jefferson, as you may know, spent some time in Paris. While there, he fell in love with a woman and started corresponding with her. In this correspondence, he talked about the foundations and the beginnings of what we now know as the United States of America. He wrote about the heart and the head, and that America was a country of the heart, not of the head. What he said was that no one would have believed that the thirteen colonies could somehow band together, have a revolution and defeat the most powerful colonial empire in the world at the time, but they did. They did it because they were of the heart, not the head, and I believe that this was an important part of my entrepreneurial fervor when I went to start AMD: create a company of the heart, not of the head.

We didn't get started the way many other entrepreneurial ventures got started, based on a particular technology or markets they wanted to exploit, but rather we were based on the kind of company that I wanted us to be. That, of course, was shaped by my bad experience at Fairchild Semiconductors, where I was ignominiously "dismissed" – that's a nice word for fired – because I didn't agree with the strategy of the top guy, and moreover he wasn't interested in hearing any of my disagreements, or for that matter anyone's disagreements. This is called "CEO-itis" today; in those days, it was just called arrogance, but you didn't tell the emperor that he had no clothes. I was 32 years old and the worldwide director of marketing, and I thought I was really good at what I did – and I was – but I still got fired. You want to talk about a life-shaping experience!

I knew then that I wanted to build a company where what counts is what's right, not who's right, and where people are treated fairly.

Coincidentally, several teams of engineers came up to me with an idea for some companies they wanted to form, or some ideas they had. I basically synthesized these into a single group, and we started AMD. It was built more on values and the kind of company we wanted it to be rather than specific products, and we now have formalized our six values. I'll only talk about the three that were really the heart of what we did then, because I think they've prevailed.

First and foremost was respect for people, and that was basically institutionalized into a motto or slogan. We say, "People first, products and profits will follow." That's based on the concept that the only long-term sustainable advantage is the difference in your people. Everybody's got the same machines, access to capital, etc., but it's your people that make a difference. It turns out that if you really have great people, and they're motivated, and you align their interests with the interest of the corporation, you're going to get some great products. If you run the business properly – and that's why you're getting an MBA – you'll make money. I have to tell you, it sounds wonderful now because we did it, but at the time, I had members of my board saying, "Not necessarily." There were a million reasons why it wasn't going to work. But because of force of will, and the fact that I wasn't interested in working for any place where this wasn't the case, we did it.

The second value is "the customer's success is our success." You hear this all the time in business schools and in the business press, "Be a market-driven company." What is a market? A market is made up of customers. Again, customers are people, and if you make your customers successful, you'll be successful. That's a better focus, in my view, than any other focus a business could have. If you take care of customers, you have a great chance of being successful. Today, we commonly refer to this concept as "customer-centric innovation."

The third value was competition. I believe in meritocracy, and combined with competition, they are two sides of a coin. I've heard people ask, "Would you be happy if everybody at Cal Berkeley's business school was a foreign student?" My answer? "Sure, if they were the best candidates that were applying to the school." I think meritocracy is the best way to run a school, I think it's the best

way to run a business, I think it's the best way to run your country and I think it's the best way to run your life. So to me, this is what AMD was going to be about: a meritocracy where we were going to pay the best people the most money.

When we started AMD, we defined success as profitable growth. Because I'm an engineer by education and not an accountant or financial type, or even an MBA, I didn't really know a lot about profits when I started AMD. But I did figure out cash flow very quickly. Cash is king. There's a lot of stuff you can do to manipulate a balance sheet to show a profit, but you can't fight without cash, so profits are important. When I say profits, I'm talking about free cash flow.

Finally, I believe that the most important thing is winning. People want to win, and winning is gaining market share. So how do you gain market share? Basically there are three ways: out-produce the competition, out-invest the competition, or out-innovate the competition. In most cases for an entrepreneur, the only way to win is to out-innovate, and innovation is the centerpiece of your overarching objective: growth.

It's really all about growth. My philosophy is the greater pie theory, as opposed to the zero-sum theory. I think creating more wealth is what we should do. Creating wealth makes a better world for everybody. If we're ever going to pull along undeveloped countries, and especially sub-Saharan Africa, we have to create a lot more growth on a global basis in order to be able to give people a shot at a fair life, at a good life.

III. Achieving Growth

How do you achieve growth? God bless Joseph Schumpeter, an Austrian economist. He said, "Growth will occur when the entrepreneur is given the opportunity to innovate and the right to participate in the rewards of his success." Right – give us an opportunity to do something, and maybe we will. Given no opportunity, we won't. The second thing, of course, is to participate in the rewards of success. As human beings, we are a wasting asset. You know that term; it means you're going to die, later rather than sooner I hope, but nevertheless, you've only got this one life to live, you've got this career period, and you have to decide how you're going to spend your life.

If you choose the higher risk approach of being an entrepreneur, working for a company that's not yet established, where your success is not guaranteed, you should get a higher reward. If you want to create more growth, you have to be an innovator, and if you're going to be an innovator you have to take risks, you should have a chance at earning a big reward. That said, I think that we have to act with our heart and not with our head. Don't plan out how you're going to get there. Just act on it. What do you believe in? What's your passion? What do you want to do?

I was the valedictorian of my high school class. I was very proud of that, the only time I was first at anything. I've been second a lot and I really don't like second, but I'm not dead yet, so we're not through. When I was talking to a counselor about going to school, my grandfather said, "Be an engineer, because if you have an engineering degree, you can get a job." That was important because I come from somewhat humble beginnings where getting a job meant being able to support yourself - it was a pretty important thing. I went to a counselor and asked, and chemical engineers made the most money. That was it; starting salaries for chemical engines were the highest of the engineering community, so I was going to be a chemical engineer. Did I want to be a chemical engineer? No, I just wanted to make a living, so I went into chemical engineering.

I went to the University of Illinois on a scholarship, which I won competitively. I won a George W. Pullman scholarship. He's the guy who invented the Pullman car. He made a lot of money, formed a foundation, gave it to worthy students who were the children of employees of the George W. Pullman Company, or in the absence of qualified applicants, anybody. By the time I was ready to go to college, there weren't any more George W. Pullman employees. The George W. Pullman Company went bankrupt, but there still was a George W. Pullman Foundation. I took a scholarship test and went to the University of Illinois at Urbana. When I found out that the chemical engineering department was in the School of Liberal Arts, I quickly transferred into electrical engineering.

Some of you aspire to be CEOs, or at least leading some activity of business. Again, I would encourage you to act with your heart, not just with your head, because what CEOs are really supposed to do is change reality and create the next boom.

There has been a lot of talk about if it is over for Silicon Valley. It's not. I've been through many of these business cycles, and the semiconductor cycle is the most common. It's about 4-5 years. They come and they go. Sometimes you find yourself on the cusp of the next up cycle, which is a wonderful place to be, rather than just the beginning of the downturn, which is an awful place to be, because you know it's going to be around for four years. If you never went through one before, you don't know that. You think, "This is going to be different this time," but it isn't. The cycle comes and the cycle goes.

The great thing about being an entrepreneur and a CEO is the power to say "yes." Everybody in management can say "no," but only a very few people can say yes. The yes thing is what makes it all worthwhile, to follow a dream, to say "yes" to something against all the odds, and just to go forward and do it. Of course, you have to accept the possibility that you might fail, but then again the successful leaders are the ones who believe that failure isn't an option.

I take great exception to this theory that's been going on in Silicon Valley over the last several years where entrepreneurs that start companies which fail say, "We've learned a lot," and therefore that makes them better for their next failure, when they will learn even more. To me, that's nonsense. Failure isn't an option. The realities are, you really have to be committed, and you have to believe that failure is not an option. I was interviewed many years ago, and I said, "I can die, but I cannot fail." That sounds pretty dramatic, but I meant it. So far I haven't done either, and I'm happy with that.

Somebody said the big problem is there's no venture capital (VC) money going into new startups, so the VCs are the problem. They've got billions of dollars that aren't deployed. My view is that's because VCs act with their head, not their heart. Some of you may say, "They have no heart," but I didn't say that. You as prospective entrepreneurs have to persuade the VCs to believe in your idea, to support your idea. My idea was a very simple one: that the customers wanted multiple sources of these semiconductor devices, and they didn't have multiple sources. I put together a prospectus that said yes, we can make a profit by developing products that replicate existing standard products, and we can build a business on that. It was a pretty modest proposal, and I didn't get a great enthusiastic response for it, but I did get the money – \$1.5 million – which was necessary to get this thing going, in equity, and AMD today is a multibillion-dollar operation. We persuaded some VCs, appealed to their head with the amount that we had in our heart. I think it's important that you recognize most people don't have courage, and they won't try new ideas. But if you want to be a successful entrepreneur, I think you have to have courage, and you have to do the right thing, and more important, most people think if we do things right, it'll all work out.

You can do the wrong thing right and it won't work out. I cannot tell you how many people over the last 35 years have called me and told me about their great microprocessor, and how it was going to change everything. I got it last Wednesday night. A guy says, "I've got a new idea for a new microprocessor. It's going to revolutionize everything. I can hardly wait to talk to you about it. But I only made one mistake," they always tell me. "I had the wrong instruction set." Let me explain. There is only one instruction set. It's called the x86 instruction set. Why is it the only instruction set? Because it's the one that Microsoft® Windows® supports. If you don't run Microsoft Windows, you lose.

Try to do the right thing, because when you do that, you lead. And people are looking for leadership. It sets direction, has belief, and so it's up to us as leaders and entrepreneurs to create the boom, not to wait for one.

Again, there's always going to be Cassandras around yelling, "It's the end of the world." It's been the end of the world about every four years since I started AMD. For me, the end of the world has come twice, but that's another story we don't have time for. Because sometimes, even though we were doing the right thing, we didn't do it right, and that also can get you. There is nothing like screwing up to bring back humility. From time to time, your best efforts just don't make it. But like the man says, it doesn't matter if you get knocked down; what matters is whether you get back up. As leaders and entrepreneurs, we have to get back up. Right now, there are a lot of Cassandras saying that IT doesn't matter. IT does matter, it absolutely matters. There's not a question in my mind that it matters, because information technology has been able to increase productivity, and productivity is what drives growth.

IV. Our Future Is Bright

Silicon Valley is poised for tremendous growth, because our engines for growth are undiminished. And the most important engine for growth that we have, of course, is the semiconductor. The entire concept of semiconductor technology, which underlies all information technology, is based on an observation called Moore's Law. What Moore's Law simply states is that about every 18 months, the number of transistors that you can put on an integrated circuit doubles. That means you can do ever more for ever less. Understand that Moore's Law has at least another decade to go. We're at the 130-nanometer size now. We're moving to 90-nanometer as we speak, 65-nanometers is two years out, and 45-nanometer a couple of years beyond that. All of these things mean that we'll be able to put a billion transistors on a chip. Simply put, the productivity gains we receive from the semiconductor cycle are far from over.

We just need to remember that we have an engine that no other industry has – the ability to produce more and more functionality at ever-lower costs. This is an incredible driver, and that's why I'm so excited about the future of semiconductors, microchips in particular, information technology in general, and Silicon Valley specifically, because nowhere else is there such an infrastructure to support these new ideas which can build on this engine.

This is about the American dream. It's funny, because in many ways now it's not politically correct to talk about the American dream. But the American dream is a global concept. I don't mean this as a nationalistic or jingoistic expression. It simply means that the next generation should be better off than our generation, and we want our children to be better off than we are. We want to create a greater pie, more people to participate, and this is a global concept. AMD has factories in China. We've got factories in Thailand, Singapore, Japan, Germany and Malaysia. People everywhere

want to make a better life for themselves and their families and their children, so what we here refer to as the American dream is what drives that. I think that's again back to Schumpeter, paraphrasing: "give the entrepreneur the opportunity to innovate and the ability to participate in the fruits of his labors, and you'll see growth."

For example, I believe every employee makes a contribution – every employee. Therefore I think every employee should be appropriately rewarded for it. When I say appropriate, that goes back to meritocracy. I do not believe that everybody should get the same amount of stock or everybody should have the same salary. I do not believe that. I believe the best people should make the most money, or they should have the most stock.

When I started AMD, we did two things that were, at the time, fairly unique and revolutionary. The first thing we did was to give every employee stock. This was 1969. You're giving everybody stock in the company? I remember being in our very small cafeteria. Our entire facility – assembly, everything – wafer fabs, the selling fabs – marked 15,000 sq. ft. I remember being in the cafeteria and these two operators were talking. One operator said, "I just got my AMD shares. What are they worth?" The other one said, "Nothing. If they were worth anything, they wouldn't have given them to us." I knew I had a communications problem. But the fact is that if they worked hard, if the company was successful, they'd have a share of that success. That was a very strong message, and it worked. Moreover, I can't tell you how many people over the years have told me what they've done with those early shares, whether they put their kid through college or bought their first house or whatever, but it's been very rewarding for me to do that.

The second thing that was very important was profit sharing. Obviously, we wanted to align the interests of the employees with the shareholders, so people talked about profit sharing. We didn't originate profit sharing, but I believe profit sharing is really a terrific thing. I wanted to use it as a retention factor, so I wanted people to view it as important because it was costing money. We inaugurated 50 percent cash profit sharing. Half of the profit share was paid out in cash immediately. We had never done that before; now it's becoming more prevalent, but it's still not everywhere, so we were trying again to balance the long term and the short term.

The semiconductor industry has grown in the 15 percent range since we've been keeping records on an annual basis. It got up to over \$200 billion in the peak of the boom; now it's down to \$150 billion, and it's starting to grow again ever so modestly. We're getting back to a growth track somewhere in the 10-12 percent range. That's an incredible growth rate for an industry that size. Why do I believe this can go on? Because we've got so many emerging markets that we've only just begun to sell to. In fact, people talk about the PC market being saturated. Nonsense. Only 12 percent of the world's population has a PC, only 12 percent, and including all the cell phones that are Internet-capable, only 13 percent of the earth's population has access to the Internet. That means that there's an incredible untapped market out there, waiting for us. If we can continue to be highly productive, we can drive prices down so that we can penetrate developing markets like China, India, and the former Soviet Union. In my view, we have an incredible prospect if we continue to grow our productivity, and the Bureau of Labor Statistics shows that there was a growth rate in excess of 4 percent in productivity in the first half of 2003. I'm delighted to say we're finally seeing some IT spending growth.

It turns out that this concept that IT doesn't matter is wrong. The bottom line is that you can use information technology to find a way to gain competitive advantage. All the little hanging fruit has been farmed, there's no question. We automated our accounting systems. So what? There's so many things that we can do better that we haven't even discovered yet. I agree with General Electric CEO

Jeffrey Immelt. He said it takes one, two, three years to get down the learning curve and figure out new ways to use IT. That's why GE continues as a large company to be a growth company, and it continues investing heavily in IT.

V. Our Greatest Threat

The biggest threat to further growth in Silicon Valley is if market forces cease to matter. Market forces means if you build a better mousetrap, the world will beat a path to your door. That's the theory. If market forces don't matter, you could build a better mousetrap and the world won't beat a path to your door. That would be a most unfortunate end for everyone involved.

An essential ingredient to ensuring market forces are at work is free trade. If we don't have free trade, market forces are at risk. Right now, America is in theory a champion of free trade, but I don't think we always walk the walk. For example, we spend \$2.6 billion to buy and ship U.S. commodities for food aid programs. Maybe you saw the article in the newspaper the other day, some people in Ethiopia can't sell the stuff that they're growing and become self-sufficient because we're shipping in grains and even lentils. This is because American farmers are selling their surplus at higher prices to the U.S. government, which comes out of your taxes, that we then ship to places like Ethiopia and wind-up undermining the efforts of third world farmers. To me, this is an *outrageous* exception to our free trade policy.

I'll take it a step further. We have corn subsidies; this is a critical industry to America, the corn industry. We have corn subsidies to the extent that we export corn to Mexico and sell it below the cost of a Mexican farmer's ability to produce it, again, keeping him from pulling himself up by his bootstraps. This isn't free trade, and this denies us the moral authority to negotiate trade-opening initiatives. The fact is we are prohibiting natural market forces because American corn is being dumped. That's a bad deal.

In fact, agricultural subsidies on a global basis are killing the concept of free trade. You probably read about the Cancun meltdown of the WTO, where people walked out because \$300 billion a year is being spent on subsidies for the world's wealthiest farmers. There was a study as reported in the *Wall Street Journal* that if we get rid of those subsidies, world trade would expand by some \$500 billion. Some of it would actually go to the developed countries. To me, that's the right thing to do, but we do have in the world today examples of subsidies and other market-distorting mechanisms that keep market forces from working. In China, in violation of the WTO, where we actually have an agreement, there are discriminating value added taxes (VAT). If you produce the silicon in China, you pay a lower VAT on the end product than if you produce the silicon outside of China. This is discriminatory, it's not free trade, and it's in violation of WTO.

Today America has too many exceptions in our free trade policy and we're losing our moral authority. We should just open the markets. We can out-produce, we can out-invest and we can out-innovate anybody. If we can't, we shouldn't win, because winning should be based on a meritocracy.

Along those lines, there are other ways to distort the market. China has a currency that is 40 percent undervalued. China is undercutting our manufacturing because they have a 40 percent undervalued currency. They can sell products back into our country, or any country, which are unfairly priced. That's a market-distorting mechanism.

I would like to talk a little bit about stock options. There is no current way to truly and fairly value a stock option. Therefore, there's really no way to expense it, because as most of you know, as business people, if you have a cost that doesn't materialize you're supposed to be able to reverse it. The government's current plans don't allow for that. You take the charge based on a fictitious valuation and when that valuation doesn't materialize, you can't reverse it. What kind of accounting is that? Right now, if your options are exercised, then the company - the shareholders - get diluted and there is a charge, there is a cost. It reduces your earnings per share because there are more shares outstanding. The present system has driven growth in Silicon Valley, and large companies don't like it, because it gives a small company an opportunity, the opportunity to let the entrepreneur innovate.

So don't be misled that no one is being hurt other than big companies who don't want anybody that doesn't have their balance sheet strength to have a chance. I'd point out to you that the U.S. tax laws are such that the company gets a deduction on the gain of an option when it's exercised, but the recipient pays a tax on that gain. The tax rate of the individual is higher than the tax rate of the corporation. Therefore, there's a net gain to the U.S. treasury and the U.S. economy as a whole.

Finally, there's the importance of free and open competition in our industry. Many years ago, when the PC was first introduced, IBM tried to come out with a second-generation bus called "microchannel," a proprietary, unique bus that nobody else had the rights to. This bus would've raised the cost of the PC, and that would've been a discriminatory thing and we wouldn't have seen the growth in the industry that we've seen since. Fortunately there was competition, and out came the extended EISA and microchannel died on the vine, and competition prevailed. That was a good thing.

In recent times, Intel said that its Pentium[®] processor would only interface with Rambus memory, and they wouldn't produce any devices that would work with any other memory. This memory was produced by one company, it was proprietary, it was more expensive, and it didn't have superior performance compared to some alternatives. Fortunately, because there was competition, AMD worked with the memory suppliers and we began to produce double data rate solutions, and it was only a matter of time before Intel capitulated. Competition prevailed. This is an extremely important thing because free and open competition is the engine for "True Innovation." True innovation is making the greatest possible technology available to the widest possible audience. Again it's all about productivity. Microprocessors and Moore's Law are the greatest productivity drivers on the planet.

AMD helped create the sub-\$1,000 PC. Now you can buy a PC for \$399, with incredible performance. This would not happen without competition for the microprocessor, because the microprocessor is the brains of that computer. Recently, Morris Chang of Taiwan Semiconductors was saying that Moore's Law must slow down. Moore's Law must stop because it's just too damn expensive. Nobody can afford these multibillion-dollar, 300mm fabs going to 65nm, 45nm, etc. Again, all information's contextual. What Morris Chang really means is *I* can afford it but *you* can't afford it, so you should buy from me. That's the subtext, because he's building them, but if nobody can afford them, why are they building them? The answer is because it is true that there are few products today that generate the volumes necessary to make a 300 millimeter, 65-nanometer fab viable, but there are some - memories, x86 microprocessors, and all those innovations yet to come that we don't even know about. Moore's Law is not going to slow down as long as one guy follows it. That's meritocracy; that's competition, and I can guarantee you AMD is going to follow it.

Without competition, customers don't get the innovation they need, or want. Recently, you might have learned that Intel is producing a microprocessor called Itanium. Itanium is our competitor's migration to 64 bits. If it's successful, this will be the most painful migration at more expense in the history of computing. This product builds on no history, requires you to change all of your existing software, it's power-hungry, will never tap the benefits of PC economics, will never go down to a handheld application, and will require everyone to rewrite software. It's rather amazing. Why? Because it's not true innovation; it's not the greatest possible technology for the widest possible audience. I want to talk about that for just a minute, because Intel is ten times AMD's size, and they spend five times as much on R&D, they spend seven times as much on marketing. Intel has transmogrified – indeed, that means going from something beautiful to something ugly, to become a marketing company. They're marketing technology that is not true innovation; it's not the best possible technology.

Centrino is a prime example. In most cases, if you want to get a wireless capability in your portable you have to buy a Centrino base. Why? Because Intel won't give their subsidies to PC makers if they use anybody else's 802.11 networking chips. Think about that – Intel has a near-monopoly on enterprise PCs. The only way that they will let you advertise [with MDF] that you've got Centrino, which they're going to spend \$300 million to promote, is if you use their networking solutions, even if there's a better one available from Broadcom or elsewhere, and there are, and so consumers are forced in the absence of competition to pay a higher price for an inferior technology. To me, this is an example of a dominant company using its market power to diminish or make market forces irrelevant. If market forces are irrelevant, then entrepreneurial fervor is useless. If the market forces don't support the entrepreneur, he can't possibly succeed. If this happens, the big companies will always win, the deck is stacked, you lose, and Silicon Valley becomes Monopoly Valley.

AMD, because we're a company built on values, has had a kind of interesting metamorphosis. We started out as a humble second source. Maybe you aren't aware of this, but over the last five years, we've been in the top 25 innovators globally, based on number of U.S. patents granted, more than Intel, more than HP. We're transcending, which I think is to go from something good to something even better, into a technology company that isn't losing its values, and this week, we announced in Tokyo that we developed a new transistor. It's a triple-gate transistor that will allow us to continue to drive the performance of the basic building block of the microprocessor – that is, these tiny little transistors, such that we can outperform anything on the planet, which will make for lower power, higher performance processors, which will enable our solution to 64-bit computing to go out all the way down to the handheld.

VI. The Next Big Thing

I've really been fortunate in the second 50 years of the last century to be part of, in some small way, the next big things. Maybe you saw the recent *Business Week* article, which outlined the "Next Big Things" of the last sixty years. In the '40s, the next big thing was the transistor. In the '50s, it was the integrated circuit. In the '60s, it was the laser. In the '70s, it was the cell phone. For the record, in two of those decades, the technology industry was actually the runner-up. In one case to in vitro fertilization and in the other case to birth control and I deny any involvement in either. But in the '80s and in the '90s, our industry represented the number one next big thing, personal computers in the '80s and the World Wide Web in the '90s. What is the next big thing? The answer really is 64-bit computing. It's going to drive job growth and economic expansion in the decade we're in. Right now, people are probably aware that 64 bits will deliver great benefit to the enterprise, as servers will better be able to address the enormous memories and databases that we need in business

applications. But 64 bits will also impact you, the consumer, by allowing you to have realism on your PC and eventually in your handheld unlike anything you've ever seen before. We call it "cinematic computing."

Cinematic computing means that you're going to have video encoding and processing unlike anything you've ever seen, and it's going to expand a whole new world. The interesting thing is, the AMD 64-bit solution is a simple migration. On the one hand, you've got Intel's Itanium, which requires enormous disruption costs, expensive implementation, a rewriting of all software, high power dissipation, and no ability to get PC economics. On the other hand, you've got AMD64 as personified by the [AMD] Opteron™ server chip we introduced earlier in the year, and the [AMD] Athlon™ 64 and [AMD] Athlon 64 FX, where you have a simple migration to 64 bits, supported by Windows up through Microsoft as well as Linux, where you can run 32-bit and 64-bit programs at the same time. You'd have low-cost implementation, lower power and it can go all the way down to PC economics, all the way down to the handheld. If we can't win -- and I said that I define winning as gaining market share -- with a product that costs less, incurs no disruption costs and has superior performance, then market forces are no longer at work.

In *Forbes* online on Monday of this week, there was a match-up, Intel vs. AMD. They pointed out many of the things I've talked about today: They're ten times our size, seven times our marketing expense, five times our R&D. They pointed out what Intel was doing compared with AMD and then asked the readers who was going to win the marketplace. You could vote right online and then see the latest tally. My heart was pounding and I was thinking, "Here we go." Intel spends a billion dollars a year on marketing and advertising, \$300 million on Centrino, wireless is all over the front pages of everything, so I voted for AMD by the way, only once. (Apparently the way the program works, you can only vote once; I tried.) We won the match-up, with 65 percent for AMD, 30 percent for Intel, five percent replying they were not sure. What does this mean for you? Watch this space as you complete your studies here, and as you go out into the business world. 64-bit computing is the next battleground. This is it. Will market forces prevail in this battle? Will free and open competition prevail? Will True Innovation deliver the greatest possible technology to the widest possible audience?

VII. Conclusion

I just have to read you this last quote to conclude on. I love this Theodore Roosevelt quote, and I want to share it:

"It's not the critic who counts, not the man who points out how the strongman stumbles, or where the doer of deeds could've done them better. The credit belongs to the man who was actually in the arena, whose face is marred by dust and sweat and blood, who strives valiantly, who errs and comes short again and again because there is not effort without error and shortcomings, but who does actually strive to do the deed, who knows the great enthusiasm, the great devotion, who spends himself in a worthy cause, who at the best knows in the end the triumph of high achievement and who at the worst if he fails, at least he failed while daring greatly. That is his place so that his place shall never be with those cold and timid souls who know neither victory nor defeat."

Don't be a timid soul; dare greatly, and you'll succeed. God bless, thank you.