

Note: This is an edited transcript.

Thank you, very much to both Robert and the audience. I am told that you had a

3 vigorous and positive morning, and I'm here to
4 be the skunk at your garden party.

5 We set an appropriate date for this
6 because you probably realize that today is
7 National Depression Screening day. I'm not
8 making this up. This is actually true.

9 One of the aspects of national
10 depression screening day is that no one need to
11 suffer in silence. So that is kind of my
12 motto in telling you some
13 possibilities and hopefully in starting a discussion
14 this afternoon and beyond about
15 the issues that are raised.

16 Not to put too fine a point on it,
17 everybody basically in this room and everybody
18 in the hi-tech industry knows from a job
19 standpoint there has been a terrible toll from
20 the recession and/or the variety of changes in
21 this industry. A large number of people, well-
1 trained, diligent people are out of work, and
2 one cannot help but ask the question: is this
3 cyclical or does this represent some
4 fundamental long-term change in the industry?

5 And this chart that you are looking

6 at, which indicates the job
7 recovery of various previous cycles and the
8 absence of a recovery in the current cycle
9 suggests that something is basically different
10 here and reinforces that the question to ask is:
11 is a circumstantial phenomenon or
12 longer term structural change? This is an
13 important question to deal with, an important one to
14 ask and answer, with particular attention to
15 higher jobs in software and services, which many
16 information technology
17 jobs fit into.

18 I want to go back a little bit and
19 give you a little bit of history of what has
20 happened in a variety of industry segments
21 because there are instructive lessons to be
1 learned. The parameter that I want to use
2 is the worldwide market share of U.S. domiciled companies vis-a-vis
4 the foreign based competitors.

6 Steel is my
7 representative for the industrial age. In a
8 relative short period of time, a matter of few
9 decades, the U.S. based market share, or the U.S. based
10 company share of the world market, went from 50%
11 to 10%, where it resides today. And as you

12 undoubtedly realize it is the subject of a
13 variety of controversial protectionist measures
14 of recent vintage.

15 Semiconductors. I have had the
16 pleasure or privilege or challenge of living
17 through the change over a couple of decades
18 from 90% worldwide market share by U.S. based
19 companies down to 40 and even sinking below
20 that predominantly due to loses to Japanese
21 competitors. Our industry in the mid 80's was
1 practically given up for good, for dead. We
2 measured our resources. U.S. trade
3 policy, and U.S. investment policy as government
4 investment policy, became partners to us in this
5 battle and we managed to regain our worldwide
6 market share, and have been holding it for the
7 last 10 or 15 years at about 50%.

8 And the question that I would like to
9 pose is: Is software next? And I think it's a very
10 valid question. When you look at the industry,
11 this market share trend of U.S. based companies
12 is heading down and market share trend of the
13 leading foreign competitive country heading up. This
14 X curve charts the development and evolution of so
16 many industries that it would
17 be a miracle if it didn't happen in the same way to the service industry.

19 The chart that follows indicates that
20 that miracle may not be there. What I'm using
21 here is a matrix of employment for software and services developed
1 abroad and those developed by U.S. companies...

2 The software and IT service
4 industry in the United States, which
5 represents about half of the world's
6 employees, and in India which represents
7 the most competitive foreign country.

8 And what you see is the beginning of
9 the same kind of X curve that I described
10 earlier. Extrapolating the trends of the last
11 couple of years and comparing them with the
12 stated goal of the Indian government in terms
13 of employment in this industry suggests a
14 crossover of the formation of the X curve in
15 the year 2010.

16 From a public policy standpoint this
17 is bad enough. This is a big industry and
18 strategic industry, on which a lot
19 of other industries depend on. So it is a
20 significant phenomenon in and of itself. But
21 what is even more interesting is that this
1 phenomenon is much broader than the software
2 industry that this (BSA) meeting represents. It

3 is something that has been chronicled in
4 yesterday's Wall Street Journal as an example
5 and is spreading into the financial services
6 industry in a fairly major way. It is the
7 footprints in the snow if you wish, which indicate
8 that the phenomenon is spreading into healthcare. I can tell
9 you two examples of it: U.S.
10 radiologists examining and analyzing the
11 data in India is one example of it.

12 And a personal one that I encountered; a friend
13 of mine who is involved with a regional
14 outpatient surgery center using Indian based
15 transcription services for fast turn around,
16 and accurate transaction of the surgical records.

17 So the phenomenon is broader than the
18 software industry, but the underlying
19 mechanisms are very much the same. And the
20 factors that drive it can probably be summed up
21 in these three categories: capacity, cost and
1 productivity.

2 Capacity in the context that we are
3 talking about the output of U.S.
4 education institutions of relevant skill
5 levels and the cost associated with that. It's a labor
6 intensive industry. The cost is predominantly
8 determined by labor rates and the change in

9 design productivity has to do with the
10 proximity of people employed in the lines that
11 I described.

12 Let me take these one at a time and
13 say a few words about them. In terms of
14 capacity, or educational output. It is well
15 recorded and well-known that U.S. based
16 university enrollment in science and
17 engineering has been trending downward over the
18 last decade, and compounding this is that the
19 drivers of innovation in the industry
20 are 50%, or greater than 50%, are foreign nationals.

1 Increasing foreign nationals leave either because
2 they want to or because they have to.

3 When it comes to cost, to give you
4 some data both on the basis of Intel's own
5 experience and industrial data, you see the
6 approximately three-fold advantage for a
7 company between professional people in India
8 versus their U.S. counterparts.

9 It is particular interesting to look
10 at the issue of design productivity and the
11 impact of virtual proximity. And what has
12 happened there is the much chronicled and
13 described telecom investment bubble has allowed

14 everything that I have mentioned to become possible.
15 So much telecom capacity has been put in place
16 all over the globe, and so much capacity, that the combination
18 of large capacity and price wars have led to a
19 huge price war that allowed the deployment of
20 this high band connectivity around the world.
21 And basically created a situation where from a
1 technical and productivity standpoint the
2 engineer sitting 6,000 miles away might as well
3 as be sitting in the next cubicle and be on the local area network.
5 The capacity that the global area network provides
6 very cheaply is comparable to local area
7 network capacity.

8 To illustrate that, this is the trend
11 in cost of this bandwidth. For comparison sake,
12 the green line demonstrates an illustration of
13 Moore's law at work in microprocessor price
14 performance characteristic. Notice we are
15 dealing with charge here, so the changes here
16 are logarithmic and what is interesting is
17 that in the last several years telecom cost
18 reduction was steeper even than Moore's law which is
19 very broadly regarded as the epitome of
20 cost vs. development in technology.

21 The responses of the observers on the
2 scene to this have been relatively benign. I submit

3 they are tainted with a measure of rationalization.

4 An example, again, from the Wall
5 Street Journal just a couple of days ago is an
6 article dealing with this phenomenon is one about a
U.S. software entrepreneur who now

8 works for an Indian software company, who says
9 that very matter of factually that the bottom level of
10 software workers will disappear. But somehow
11 the article suggests that all is going
12 to be okay because all we are going to give
13 up is the low-end software work, the drudge
14 work if you will and U.S. workers will have the
15 high-end work associated with them.

17 I think it is worthwhile to refer
18 back to very important study by Christianson from the Harvard Business
20 School under the heading of “destructive
21 technologies” where he studied how the
1 phenomenon of new technologies (which I submit
2 offers virtual proximity software) is how
3 they play out. The way they tend to play out
4 is: at first this is only able to
5 deal with the low end segment of any market.
6 But dealing with that market fuels the
7 capability of the disrupter finally, as well as
8 skills level, leading it to encroach into higher and

9 higher markets. If executed correctly, even
10 though it starts at the low end, always start
11 there, they work their way, the new capability,
12 the new technology, the new phenomena works
13 it's way up from the bottom.

14 I don't see anything particularly
15 different in this instance. So I think it's
16 germane to ask: what is the
17 public policy advice via this
18 subject?

19 And I am hard put to find a
20 documented public policy statement on this
21 global shift that is enabled by the virtual
1 proximity, not even whether it is good for the U.S.
2 economy, or bad for the U.S. economy. What
3 would we do about it, in any event.

4 Since I can't find a statement, I will have
5 to do the next best thing and reconstruct the
6 de facto public policy out of relevant actual actions in
7 North America that we can observe.

8 The public policy involves educational
9 performance, funding, infrastructure and what I
10 call industrial business friction. Science and
11 engineering, the performance of our K to 12
12 institutions, has been documented to be poor by
13 worldwide comparison. I mention probably as a

14 result or partially as a result of the graduate
15 students are made up very heavily out of
16 foreign nationals. Academic R&D funding is
17 heading downward. Our infrastructure is
18 nothing to write home about. And the friction
19 issues, as I will show you by some illustration,
20 are growing.

21 So let me take these and give you

1 kind of a hint of the future.

2 The first one is the R&D funding, which as a
3 percentage of the gross domestic product has
4 been less and less and less.

5 This is in the face of clear
6 articulation and the recognition by society at large
7 that we expect technology to be the answer to
8 our economic issues, as well as our employment
9 issues.

10 When it comes to infrastructure, I use
11 one measure of that: domestic broadband penetration
12 in the United States, as compared to the leading
13 example – Korea. And while I'm very
14 happy to be one of those 20% of the population
15 that has broadband in my home, looking at the population as
17 a whole, it is certainly not a leading
18 performance for the U.S.

19 When it comes to friction, the first
20 thing to address is incentives to get the best
21 and brightest to work in this industry and work
1 hard. It is encouraging to read a
2 governmental statement that says "it is our
3 intention to train and bring into the country
4 technical and managerial professionals and
5 introduce bonus and share operations to
6 remuneration."

7 If I was present in your audience I
8 would use your electronic response mechanism to
9 poll you with a have simple question. What
10 government do you think stated its incentive
11 policy in this fashion?

12 And I dare say, I venture to guess,
13 that very few of you would pick the People's
14 Republic of China as being the one for which stock
15 options check and recruitments incentives are
16 part of stated national policy.

17 There's another friction issue which
18 has to do with intellectual property that we should
19 talk a great deal about. And the trends here
20 are not particularly favorable to our increased
21 productivity...

1 The number of software patents issued
2 has skyrocketed in recent years. The number

3 of patent software patents in the backlog
4 according to the head of the patent office are
5 expected to reach a million items. This leads
6 to terribly increased litigation. Let me call
7 your attention to this chart, which shows the
actual judgments rendered in software

9 intellectual software cases over a 15 or so
10 year period of time.

11 So what you see is 5 million to four billion
12 dollars change over the 15 year period of time.

13 A large
14 portion of the software talent and managerial
15 talent in this country is associated with
16 issues of this sort representing another
17 element of friction.

18 Inevitably the question has to be, as
19 soon as you buy into this problem, what could
20 and what it would be done about it. And I have
21 thought a fair amount on this issue, and I have
1 talked to a lot of people who are equally
2 concerned and smarter than I am. And the
3 conclusions come in two categories.

4 One is, by all means fight any
5 trends towards protectionism, domestically and
6 abroad. Protectionism defeats the whole

7 purpose and in the case of electrons traversing
8 wires and fiber optic cables, etc., if I remember optics, it's
10 impossible to enforce anyway.

11 Secondly, I would like to see us
12 rally around the goal of doubling U.S. based
13 software and service productivity. Because it
14 is only through more a productive workforce that we can
15 create jobs in the face of the cost
16 disadvantage an various other challenges that
17 I described earlier.

18 Which then begs the question, how
19 did you go about that? I can only provide you
20 with a deposit of some thoughts. Let me say
21 right in the outset that if we did everything
1 that was coming on this one and next fall, it
3 would only make additions on the margin. There
4 aren't any revolutionary changes. But at least I would
5 like to put them in there as a starting point
6 for the discussion.

7 I identified the issues involved. We need to do research on
9 productivity related technology in the software
10 and service industries, which are the higher
11 evaluated industries that we are pinning our
12 hopes on need to generate innovation and
13 faculty, money is the fuel of the
14 technical education system.

15 This in the face of the declining
16 investment in science and engineering
17 education, it is a daunting challenge in and of
18 itself.

19 I would like to see the universities collaborate more with the
20 best of industry. I would like to
1 see us rally around a policy similar to what
2 the government of China has articulated, to
3 attract the best and brightest with incentives
4 and appropriate immigration policy. When it
5 comes to friction, raise the hurdle for
6 litigation so that we don't get involved in a
7 litigation wave and make the patent office
8 more discriminating and more expeditious in
9 evaluating filed cases.

10 And, of course, at a time of very
11 major Federal Government, the question comes
12 can we afford it? And I guess the only way I
13 can answer it is a cursory look at what our
14 government has spent and is spending on
15 supporting industries that can reasonably argue
16 represent past performance of the U.S. economy,
17 A small percentage, 1 to 2% diversion of industry
19 support spending will make a very, very
20 monumental difference in the areas that I

21 described on the previous chart.

1 A question for all of us in this
2 room, and for people in the beltway and for
3 people outside the beltway, people whose jobs
4 are at stake is: do we have the national goal
5 to take purposeful action.? Experience shows
6 that action of this sort can only work if it's
7 taken before the phenomenon that it's supposed
8 to cure occurs, because then it is too late.

10 I have to tell you, given this
11 national depression part, what depresses me most is
12 not that we haven't done these things... But
13 that we haven't even articulated the problem,
14 haven't recognized it. And even though the presidential
15 election campaign is upon us, I
16 haven't even picked up streams of problem
17 recognition and a debate on this issue and what
18 could be and should be done about it. And even
19 if that debate started today, I think time is
20 not our help. Time is our enemy. If it
21 doesn't start, the notion that our
1 actions will be too little too late are too
2 depressing even for me. So thank you, very
3 much for bearing with me.

4 (Applause).

5 MR. HOLLEYMAN: Dr. Grove thank you so

6 much for being with us today for that presentation.
7 I think we have time for a couple of questions from
8 our audience.

9 Let me ask the audience for their
10 questions.

11 MR. SNAT: Dr. Grove, Jonathan Krim with the
12 Washington Post. You talked about the exodus of
13 jobs in the IT and particularly software and
14 services sector. You did not talk about the
15 software and hardware and IT companies that are
16 steadily moving jobs offshore.

17 I assume that's a major contributing
18 factor, so in effect you have our own industry
19 participating in this trend. I know Intel included.
20 I would like to know where the balance is there.

21 ANDY: I completely agree with what you are
1 asking and the implication of the comment. Those of
2 us in business have two obligations in my opinion.
3 The one that's un-debatable is we have a fiduciary
4 responsible to run our business for the shareholders
5 who put us in our place, gave us the decision making
6 power.

7 We are expected to and legally required to
8 do the best job we can for them, provided we stay
9 inside the law. There is another obligation that I

10 feel personally, given everything that I have
11 achieved in my career, and a lot of what Intel has
12 achieved in its career, were made possible by a climate of
14 democracy, an economic climate and investment
15 climate provided by our domicile, the United States.

16 I feel a responsibility for doing the
17 right thing for the country that has allowed us to
18 be in a position where you can ask this question.
19 These two are pulling us in different directions.
20 That is where I'm looking for public policy to help
21 guide us, reinforce the relationship between the
1 two, reconcile the conflict. In the absence of a
2 public policy that tells me what to do, I have no choice as
3 corporate manager, nor do my colleagues at Intel and
4 outside of Intel... that very often
5 involves moves of jobs and moves of capabilities
6 into other countries.

7 MR. HOLLEYMAN: Other questions.

8 MR. SNAT: Marsha Sterling. I'm general
12 counsel for Autodesk. You described two of the
13 possible responses to this problem as improving our
14 educational system in the science and math areas,
15 and also tracking the best talent in the world to
16 U.S. companies.

17 How does the risk of stock option
18 expensing impact our ability in those two areas.

ANDY: My position of actually single stock options as being
20 somehow associated with corporate scandals has been
21 pretty well established. I don't want to repeat
1 myself. But I think exactly as your question
2 implies, we need that problem like we need a hole in
3 our head.

4 MR. SNAT: Drew Clark, Technology Daily. You talked about the friction
5 stemming from litigation of patents and intellectual
6 property. Could you speak a little bit more about
7 how to stop this? Your graph of software patents
8 sky rocketing led one to wonder, is more patenting or
9 less patenting or something else entirely part of
10 this reducing friction solution?

11 ANSY: I think there are
12 basically two reasons why
13 software patents may have skyrocketed. One is
14 that the evasiveness of our software industry has
15 suddenly turned extremely good factor of 10, 20
16 better than it has been before over a two year
17 period of time. The other one is that the patent
18 office is overworked, flooded with patent
19 application. And doesn't affect the patents as
20 author there any and with a hurdle as high as it
21 might.

1 I am unfortunately believing that the

2 second one is a case. A lot of these patents, have
3 according to people who are reasonably familiar with
4 many, quite a bit of prior art that has not been
5 discovered, there are arguments that one can make
6 that some of them are trifle rather than reflecting
7 true intention. Nevertheless, they can form the basis of
9 litigation.

10 That's not what we need as a public policy. That
11 is not what we need in the face of the many
12 challenges that I mentioned.

13 MR. HOLLEYMAN: We have time for one more
14 question. Someone standing at the mikephobe.

15 MR. SNAT: Forbes.com. Some of the CEOs this
17 morning described off-shoring as a train that can't
18 be stopped and they were on jumping on it. How
19 can the industry rally around what you see as an
20 oncoming crisis when there's such a division of
21 opinion about what the whole issue means?

1 ANDY: how can we deal with a complex issue
2 that involves trade policy, intellectual property
3 policy, litigation policy, government spending
4 policy without having diversion of opinions?

5 That is how democracy works. I'm putting
6 this issue on the table because the trends of this
7 industry are very reminiscent to me in what I have
8 lived through in the semiconductor

9 industry.

10 We took pretty serious action in the
11 mid 80's in terms of government policy, in terms of
12 spending levels, in terms of university education, and
13 in terms of internal restructure, and have managed to arrest the trend toward an X
curve.

16 We haven't referred it really. We have
17 stabilized it. It took a lot of debate. There was
18 a lot of disagreement between members of this
19 industry for while. As a result of debate and
20 consideration, the disagreement converged to a
21 platform and stated policy. Then there was
1 quite a bit of debate within the industry and the
2 Federal Government. But at the end we got our act
3 together and the action was better than in many
4 other instances.

5 That experience leads me to believe that
6 something similar could and should happen in case of
7 the software and service industries and sooner is
8 better than later.

9 MR. HOLLEYMAN: I would like to thank,
10 again, Dr. Grove for joining us today. I believe
11 he's done a superb job in setting the stage for the
12 afternoon session about transforming today's
13 challenges into tomorrow's realities. Thank you, very
14 much.