

UNITED STATES OF AMERICA

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DEPARTMENT OF COMMERCE

TECHNOLOGY ADMINISTRATION

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SUMMIT ON THE USE OF ADVANCED TECHNOLOGIES IN
EDUCATION AND TRAINING

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AFTERNOON PLENARY SESSION

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FRIDAY, SEPTEMBER 27, 2002

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The summit came to order at 1:46 p.m. in room 4830 of the Department of Commerce, 14th Street and Constitution Ave, N.W., Washington, D.C., Phillip J. Bond, Under Secretary for Technology, presiding.

PRESENT:

Phillip J. Bond		U.S.
Department of Commerce		
John Bransford	Vanderbilt	
University		
Karen Billings	Software	and
Information		
	Industry Association	
William Wiggenhorn	Cigna	
Corporation		
Irving Wladawsky-Berger	IBM	
Ralph E. Chatham	Defense	
Advanced Research		
	Projects Agency	
Ulrich Neumann	University	of
Southern		

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I-N-D-E-X

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Gary Bachula	

1 P-R-O-C-E-E-D-I-N-G-S

2 (1:46 p.m.)

3 MODERATOR BOND: I'd like to again thank
4 everybody for being here and engaging so thoroughly. We want to
5 hear summaries from the two different breakout groups. Let me
6 call on Gary Bachula first to come and give us a report on his
7 group.

8 BREAKOUT SESSION REPORTS:

9 GROUP 2: POLICY AND INNOVATION ISSUES

10 MR. BACHULA: Let me start by saying our group
11 agreed that we shouldn't let the research group have anything
12 they want until we actually have a plan for taking that great
13 research that we are going to hear about and moving it in
14 systematically. The assumption is that there has been an awful
15 lot of experimentation going on in schools, not all of it in
16 technology but lots of experimentation over the years. Very
17 little of that has moved itself into the core of the way we
18 teach.

19 It's not unlike commercializing a product from
20 R&D. Science and technology developed great ideas and then the
21 movement of that to a broadly diffuse commercial product that
22 millions of people use.

1 It is a very complex process involving a whole
2 lot of issues. It is not a handoff. It is not something where
3 you can just go from R&D to hand it to venture capitalists and
4 automatically go there. There is a rich array of regulatory
5 issues, tax issues, investment issues, standardization issues.

6 In this area, we concluded that this is
7 particularly a very huge, very huge, systems integration
8 problem. There are many conflicting issues we have to work
9 together.

10 If you just think of the *2020 Visions* document,
11 where you have this vision of people who are accessing
12 information wirelessly, it must go to some server somewhere
13 where there is this huge archive of digital information that
14 gets processed and transmitted back to you. This happens in the
15 school. This happens at home.

16 You have obviously user devices there. You have
17 wireless and fiber networks there. You have software there.
18 You have creators of the content. You have questions of who
19 owns that content and the copyright and protection issues. You
20 have privacy and security issues that intervene. You have
21 business models. If there is a single archive of that content,
22 who owns it? How do you pay for it? There is a huge array just

1 on the technology side of it.

2 Then when you go to the second area, which is
3 content creation, and, again, let's assume that the results of
4 research have shown us how we can make people learn. You do
5 have the question of who creates the content, who protects it,
6 who gets paid for it, how you incentivize creating it, how you
7 also make it accessible.

8 Thirdly, probably the biggest issue of all is how
9 do you change the people and the institutions and the systems
10 that are currently in place. How do we get from here to there?

11 So I have a couple of more detailed notes that I
12 want to get to just to go down my list, but the over-arching
13 message that I got from our discussion is that this is a huge
14 systems integration problem. And if we were to think of it as a
15 20-year systems integration problem, there is no current
16 institution that exists to do that integration.

17 It is not the U.S. Department of Education. They
18 need to be a big player, but it's not them. It's not just NSF.

19 It's not any one institution at all because you are trying to
20 tie together development in the computer and the software
21 industries. You are trying to create digital libraries. You
22 are trying to change the way teachers are trained.

1 It was pointed out in our meeting that the
2 veteran teachers for this *2020 Visions* document are currently 15
3 years old. So there are questions of training today's teachers
4 to use today's technology. But if we wanted to leap ahead and
5 sort of skate toward 20 years from now, we have an opportunity
6 to do some things with these younger people right now to make
7 sure they are ready down the line, but it is a huge systems
8 problem.

9 So what we concluded in this wide variety of
10 issues that we talked about was that folks thought there were
11 more resources needed for almost everything. There was not a
12 person in the room that said we didn't need more money, that it
13 would take partnerships.

14 It would take some kind of new leadership,
15 probably from very high, to pull together these various and very
16 disconsonant right now kinds of groups and organizations, that
17 we needed to do some experimentation and research and find out
18 what works, and we need to enable that.

19 We need to enable that in classrooms. We need to
20 get past the barriers, the rules, the whatever sort of localized
21 kinds of things are so that someone can try out an experiment.

22 At the same time, we need to make sure we can

1 scale those that work and replicate them. This is probably more
2 a personal statement than the group as a whole. If there has
3 been one failure in the past, it has been the failure to scale
4 and replicate. There are 1,000 great examples of things that
5 have been done already that we can point to, but can we get that
6 into 100,000 classrooms and can we do it efficiently and
7 cheaply? Can we measure results?

8 So we talked about the need for integration. We
9 talked about the interaction of different policies. There was a
10 little go back and forth between some librarians and the
11 software folks about copyright, which was quite delightful.

12 I think one of the messages that came out of that
13 is that if you think in the education context, perhaps this
14 whole digital rights management debate in Washington needs to
15 have some educators at the table and not just Warner Brothers,
16 IBM, and someone representing Napster because in the education
17 world, we do have libraries. There is a public library history
18 in this country in education. When you move it to the digital
19 world, it creates some real interesting problems. We haven't
20 solved those problems yet, and those are areas that we need to
21 work on.

22 Training of teachers and training of teachers not

1 only to use the technology but to sort of think about the whole
2 process being fundamentally different. You know, in the
3 business world, they call it business process reengineering. At
4 least that was an old word. It was used a few years ago. And
5 how does that get integrated into the process?

6 Discussion of a national archives of digital
7 content and what it would take to do that and what business
8 model would create it and who would own it and is it just
9 publicly owned goods or is it a combination of public and
10 private and where does that come from.

11 The issue of content migration from one
12 technology platform to another came up, the idea that you can
13 create a really wonderful piece of software, multimedia
14 curriculum materials. And it only seems to work for like 24
15 months.

16 And then the new computers and the new network
17 technologies come out. And you have to like reprogram it all
18 over again. We need to be able to take good content and keep
19 moving it from platform to platform, even as things get updated.

20 How to get content and technology to work
21 together. There is a whole issue of standards here, not the
22 accountability standards that are most important in education

1 but the standards of how you inter-operate systems, how you
2 inter-operate different digital models of software, the
3 hardware, the wireless devices on one end to the networks, to
4 the servers all over. There is a very big issue there.

5 The issue of how you scale up from R&D to a
6 system-wide use of a new technology, who invests, how do you get
7 past the barriers, large issues, the issues of whether this
8 really is a radical, as opposed to incremental, innovation, a
9 number of the people in the room said that we needed to think of
10 it as radical. And the process that you normally get to a
11 radical change is not the same as you do for sort of steady
12 incremental change.

13 How do you move from parallel stacks? Again,
14 common theme mostly that I took out of this again is that this
15 is a -- if we were to try to move towards the *2020 Visions* that
16 were in that great document that was published by the Commerce
17 Department with all of the discussions and all of the various
18 players that were represented in this meeting, you would need to
19 create a very large systems integration project.

20 I don't mean necessarily at the outset a costly
21 one because the coordination of it could be a staff of five
22 people, but you need to create a very large project that reaches

1 across from all of the traditional players in education to the
2 players in technology and science and research and pull them all
3 together somehow and get them talking up front, even as new
4 technologies are developed.

5 There was a statement said that, you know,
6 libraries should be consulted before technology companies
7 develop their products. Obviously that was not happening today.

8 So it would be great if that kind of thing could happen, if we
9 sort of pull these kinds of people together.

10 There were many other things. And I will invite
11 anyone who was in our session to add a word or two here before
12 we hear from the other group. My message probably was that if
13 we only do research but we don't think about how to move that
14 research into a million classrooms, then a lot of that research
15 will get lost. Moving it into a million classrooms is probably
16 a lot harder than doing the research in the first place.

17 I don't know. Bruce, did you have other?

18 (Applause.)

19 MR. KELLY: Well, thank you.

20 GROUP 1: RESEARCH AND DEVELOPMENT ISSUES

21 MR. KELLY: We find ourselves in violent
22 agreement with everything that Gary said. So you are going to

1 be finding the same themes here picked up from another point of
2 view.

3 Our goal was to try to figure out how we can move
4 forward on research and research management. One of the issues
5 that we began with was Irving's provization that this was harder
6 than cosmology. And we have to admit there were no cosmologists
7 in the room, but no one basically challenged the fact that this
8 was undoubtedly the most complicated and important research
9 problem that we are facing.

10 The kinds of things that we need to do to begin
11 to approach the *2020 Visions* scenarios span a huge range of
12 basic, applied, and other kinds of research. So we didn't even
13 pretend to try to put together such a research plan given that
14 we had a brief period of time, but we did spend a little time
15 just suggesting the diverse kinds of things that need to be
16 included in this portfolio.

17 They range from the kinds of very basic research
18 in how people learn, how they build expertise, perhaps even how
19 the brain functions and processes information and learned, in
20 particular, that NSF is starting a very large new program
21 focusing squarely on that set of issues.

22 Then there was a series of things dealing with

1 what is more in the applied research mode, what Defense
2 Department would basically call 6:2 and 6:4. How do you build
3 in test tools? These are tools to build the kinds of
4 simulations that we are talking about where they were simulating
5 human body or telescope or a management scenario. There are
6 tools for bringing people together for measuring performance.

7 We discussed the need to build a tight
8 infrastructure, the kind of grid system that Irving was talking
9 about and how do you build that on top of the research that is
10 already going on in that area.

11 And then there is a series of extremely applied
12 research, where you actually have to test and evaluate these
13 things in practical situations in a variety of different places
14 and get feedback.

15 So you have this whole spectrum of research.
16 Plainly, we are just scratching the surface here, but this is a
17 daunting set of tasks. So our next question was, if you are
18 going to put together a research management plan that could
19 actually support that diverse range of research, test it, and
20 feed it back, how would you go about doing it? What are the
21 performance specs you would expect of a manager who tried to put
22 this together?

1 We came up with the list that you see here. In
2 brief, it needs to support certainly everything from the most
3 basic to the applied.

4 One of the themes that kept on coming up
5 repeatedly was the need to build interdisciplinary teams. By
6 "interdisciplinary," this means crossing everything from basic
7 cognitive scientists to people who have experience in
8 classrooms, computer scientists, to business people who have
9 specific tools.

10 You also need to have this thing work to teach
11 everybody everything. So this means teaching history, teaching
12 computer science, probably even teaching cosmology if we do this
13 right.

14 In order to do this, you plainly can't draw on
15 the skills of any individual agency. It is not enough to draw
16 only on government funding or only on academic or only on
17 corporate funding. You have to find a way to draw on all of
18 these services in support. So you need to find some way to
19 build an intergovernmental team.

20 Another strong theme that kept on coming up was
21 the need to sustain this. You plainly need to deliver results.

22 You plainly need to have some kind of a competent assessment in

1 management discipline in this process.

2 This is going to be a long haul. And so you are
3 going to have to judge things on what they can deliver in the
4 short term but also have an idea that this is going to be a
5 20-year project because these are, in fact, some of the toughest
6 problems human beings have ever encountered.

7 So the next question is you say, "Well, that is
8 very fine. This is a tough job to actually design such a thing.

9 So what are you actually going to do?" You are going to go
10 back and face the enviable task of facing Under Secretary Bond.

11 And he says, "So what do you want me to do about
12 it?"

13 One of the thing that we see necessary here is to
14 make it clear to the country that this really is a key part of
15 the solution to a problem that people deeply care about.

16 One of the things that people deeply care about
17 is leaving no child behind. This is something that the
18 President has certainly done an excellent job of putting on the
19 charts.

20 I think we can make a pretty convincing case that
21 in the long term these technologies and this kind of research is
22 absolutely essential to meeting that goal. The point is there

1 is also a set of drivers having to do with training the
2 workforce, training our military.

3 But there are things that we need to do,
4 therefore, that I think the country has completely bought into.

5 And so you have a set of drivers that say that not only is this
6 one of the most difficult problems that the country is facing;
7 it is, without question, one of the most important research
8 problems that we are facing.

9 Now, having said that and having this event and
10 the bully pulpit of the Commerce Department and other agencies,
11 I think that this is going to be a case that can be made and the
12 public will, in fact, understand.

13 The next question is, how do you actually draw on
14 the resources of the federal government across the many agencies
15 that contribute so that you actually build a team that can
16 deliver on this.

17 While all of us were very enthusiastic about
18 setting the expectations out there, nobody left forward and
19 said, "We have a well-defined plan that could be executed."

20 On the other hand, what we think, we think the
21 sense of urgency here really should prompt the federal
22 government to try to move quickly. That involves several steps.

1 One is to find a way to articulate the kinds of research that
2 you need to do, put together a detailed research plan that
3 actually does well what we did sketchily on that first chart,
4 start trying to develop some concrete proposal for how you would
5 manage this. We would suggest that the point of this is this
6 only works if you get many agencies to play and draw on the
7 unique capabilities.

8 NSF is plainly doing a splendid job in supporting
9 basic research. It's going to build on that capability. Labor
10 has a component. Department of Education, of course, has as one
11 of its core visions leaving no child behind. The Department of
12 Defense has its own set of training requirements, Department of
13 Labor. All of these agencies have a vested interest. And they
14 have a lot of competencies to bring here.

15 So the only place where this team can be brought
16 together is at the level of the White House, the President, the
17 NSTC, which is charged with doing this.

18 So we would strongly suggest that this be brought
19 as a priority issue to that and that one of the obvious groups
20 to bring this to the attention of this group is the Department
21 of Commerce, which I think has the competence to look at the
22 basic process of innovation and can look with some objectivity

1 across this whole range of research plans and I think has the
2 respect of all the agencies for its ability to do this. So I
3 think that they would have a considerable standing in bringing
4 this before the White House for a decision.

5 So basically we have in a way dodged the bullet.

6 We don't have a detailed program to offer, but we are certainly
7 offering to help in an accelerated process.

8 You define the research that needs to be done.
9 The industry people and the academic people in the room I think
10 are all willing to help support any process that you do pull
11 together and volunteer their time and their expertise in
12 building this and supporting it any way we can.

13 So thank you.

14 MR. WADAWSKY-BERGER: We also recommended that,
15 in addition to bringing the proposals to NSTC, that Commerce
16 should bring it to the business community, whether it's the
17 business roundtables, NSTC, or other such fora, to get their
18 support so that as the proposal comes out, it will join public
19 and private sector partnerships.

20 MR. KELLY: Okay. I don't think there is anyone
21 else on our team who wants to amend. Exit stage left rapidly.

22 (Applause.)

1 MODERATOR BOND: Thanks, Henry. Again, thank you
2 all. So what I scribbled down to myself here is the notes about
3 the hugeness and vastness of what we have come together today to
4 talk about, huge integration; huge research; huge tech transfer;
5 huge culture change; huge training challenge; indeed, harder
6 than cosmology, all of which are probably true. And, yet, to
7 take steps toward this generally shared visions that we have on
8 where America can and should be, we need to identify some
9 attainable concrete steps.

10 I think we made some progress in both groups to
11 identifying those. We are going to attempt to take those steps.

12 I can commit for Commerce that we will present these notions
13 along with our partners at NSF and the Department of Education
14 to the National Science and Technology Council. So we are going
15 to begin these steps.

16 As we all knew when we came here today to
17 contemplate this incredibly huge idea, we weren't going to solve
18 the problem today in a few hours of discussion.

19 What we did today together was to light a fuse.
20 So I want to leave you with this, which is a plea to stay
21 engaged, to re-up. If you want to continue to be a part of the
22 ongoing collaboration in this space, let us know that. Carol

1 Ann will be in touch with all of you.

2 To follow up, we will be posting a transcript of
3 discussions in both workgroups and the preliminary session for
4 you to review. But you need to let us know you want to stay
5 engaged.

6 I am very confident as we move forward that any
7 role to be had with the private sector, that Commerce will be a
8 big player in that space. So I can say I look forward to
9 working with most of you on this as we go forward.

10 Stay engaged. Please stay involved. This is a
11 huge but necessary task. Thanks for being part of it.

12 (Applause.)

13 (Whereupon, at 2:09 p.m., the foregoing matter
14 was adjourned.)

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