Innovation: Turning inspiration into critical customer assets

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Over the past two decades Xerox has been a leader in the world of commercial printing. Today I want to share both exciting technologies that recently hit the market, as well as take you inside our research labs and give you a peak into the future. You'll see some emerging technologies that we are turning into innovations that will make our customers more effective and efficient and thus more profitable.

Our scientists and engineers around the globe, every day, conceive new promising ideas. But ideas and inventions alone are not enough.

Innovation is creating new customer value

As I like to say: "Innovation = Invention + Intrapreneurship."
Innovation is creating differentiated customer value, resulting in attractive economic returns.

Inventions are the creative spark of an individual. However, getting this novel idea into our customer's hands does not happen without a lot of leadership from an intrapreneur who builds a maverick team, and rallies sponsors and partners around the idea such that it gets successfully commercialized.

Dreaming with our customers

One of the ways we innovate is through dreaming with our customers. A difference today and how we used to perform research, is that now Xerox researchers focus on customer pain points, areas of your business such as processes or systems that are not as effective and efficient as needed. These customer pain points are the most important source of inspiration.

The researchers have frequent dialogs with customers. Of course, there is a caution here as well. Some inventions are so out of the box that customers will not tell you they need them in reply to open ended questions. As Henry Ford once said, "If I had asked my customers what they wanted they would have said a faster horse."

So what Xerox researchers do? Xerox work practice specialists observe customers in their environment. We also "dream" along with our customers. Together we envision a future where our inventions make your pain points disappear.

In fact, in our Xerox booth on the show floor here today, we are running a social Web-based experiment to solicit your input regarding your pain points… please do pass by and share your thinking with our researchers. Already, we have received a number of suggestions.

This morning I will share several examples of how these dreaming sessions have led to critical customer assets. Before I do so, let's take a brief look into the past.

Business Week – Office of the Future

It was more than 30 years ago -- In 1975 – that Business Week published an article entitled "The

Office of the Future." In the article, the author tried to envision what the modern office would look like at the end of the 20th Century.

The article quoted Xerox's George Pake, the founder of PARC. In the next 20 years, Pake predicted, every office would be equipped with:

"…a TV-display terminal and a keyboard sitting on every desk . . .
We will be able to call up documents on the screen from stored files. By simply pressing a button, we will be able to get mail messages from others …"

Today, the PARC foresight — expressed a decade before we saw a personal computer in the market — remains remarkably visionary. After all, in 1975, few people outside the scientific community had experience with information technology, much less the ability to imagine its future capabilities.

For the scientists at PARC, however, their vision of the future was clear. Before the Business Week article was published in 1975, they had conceived, invented and developed a distributed computing environment featuring:

- the mouse-driven graphical user with windows, icons and pull-down menus
- the bit-map display which enabled WYSIWYG editing of electronic documents
- the digital laser printer which transformed those bit-map images to paper documents
- the Ethernet protocol which linked file servers, workstations, and printers in a local area network

So, by 1975, Xerox researchers were using these emerging technologies that would later define the office as we know it today. In order to create the future, one has to invent it, as PARC researcher Alan Kay used to say.

Business Week – Children of the Web

Now fast-forward more than 30 years. Business Week recently published a cover story entitled, "Children of the Web."

The story describes a different dynamic. Business is no longer at the forefront of innovation. Instead, the article says, business is playing catch up "to the tens of millions of digital elite who are at the vanguard of our fast-changing culture."

Innovation is no longer happening as it was back in 1975, within closed organizations.

Not only are individuals around the world comfortable with the way technology is changing their lives; they are participating in huge global social networks, they are experimenting with and driving the technological change. Innovation is introduced to and by individuals in their personal lives, and then adopted by business.

Blogs, Wikis, Facebook, Skype, Twitter, YouTube, Instant messaging, Lulu.com, and 3-D virtual worlds — to name just a few— all have been invented for applications in our personal lives before being leveraged by businesses.

For businesses to successfully innovate they must leverage the wisdom of the crowds without getting lost in and overloaded with all the information created by the crowds.

Information overload in the workplace

Today all of us are blessed with an abundance of information. Internet and corporate databases instantly supply information on any topic imaginable. At the same time, PCs and mobile devices enable instant communication with colleagues and customers around the world.

No matter where we look for information we are flooded with way too many items, lots of it inaccurate and irrelevant to the decision we need to make, or action we must take.

To illustrate the magnitude, let me quote a few numbers from a report by the internationally respected research firm IDC:

- In 2007, 281 exabytes of digital information were created, captured and replicated. That's 281 followed by 18 zeroes.
- To give you an idea, it is the equivalent of taking all the information inside every book ever written in the history of the world, then multiplying it by 5 million.
- It is the equivalent of 20 stacks of books extending the 92 million miles from the earth to the sun – all created in just one year.
- And this information explosion will only accelerate. The amount of information created and replicated is projected to reach a zettabyte by 2010 and grow six-fold by 2011.

Amid this explosion of information, people find it difficult to gain the knowledge needed to make decisions or take action. At Xerox, we view this situation as an opportunity to provide services, workflow and technologies that will allow customers to quickly cut through this clutter and have the required knowledge at our fingertips.

Our Xerox Global Services Consultants collaborate with customers such as law firms or schools, financial institutions and hospitals to help automate their workflow, manage their information by automatically categorizing information, extracting meaning from all different types of unstructured data and documents, and driving workflows.

Mass customization trend

However, since we are at the On Demand show, let me look at the world of printed production pages. In 2007, over 28 trillion production pages were printed world-wide, almost all of them analog offset pages. Less than 3.5 % of these pages are printed on digital presses.

According to the Caslon 2008 Market Study, by 2015, the number of pages printed is expected to basically remain flat. Digital printing however will increase by 5 % and the amount of color digital pages will quadruple, from only 11 % of digital pages in 2007 to almost half in 2015.

A continued analog to digital shift is expected due to several factors:

- Digital printing allows for shorter run lengths, customization and personalization. It allows you to print just what you need, when you need it and where you need it.

- Digital printing results in significant savings in inventory and a reduction of obsolete documents.
- Digital is an increasing answer to environmental concerns, it reduces the amount of pages that are not useful and end up being wasted; such as books or magazines never sold.
- And variable data printing opens op all new opportunities such as photobook printing or digital packaging.

We at Xerox, are helping our customers take advantage of this new mass customization trend. We are now at a perfect place in time and technology. Large enterprise or customer databases can be data mined and linked into print workflows. Customized marketing brochures can fly off your digital press at over 100 color cut-sleet pages per minute.

Xerox innovation heritage

At Xerox over 4,000 engineers and scientists around the world are engaged in several projects that enable the mass customization trend in a sustainable way Together with our joint venture partner, Fuji Xerox we invest about $1.8 billion in research, development and engineering each year.

Here's what our investments resulted in:

- We have been issued more than 55,000 patents worldwide in the history of our company,
- We get issued over 10 new patents each and every week.

Our investments have, and continue to be critical assets for our customers.

- Over the past 3 years, we launched over 80 new products and services, which, in turn,
- Have accounted for 2/3 of our new sales revenue and
- Which have been recognized with more than 500 awards, including the Corporate Innovation Award by the IEEE; and in the U.S. National Medal of Technology, the highest technology honor awarded by the President of the United States.

Xerox research worldwide

Let me give you a brief overview of where some of our research is being done.

- Located near San Francisco is the Palo Alto Research Center, or PARC, which I spoke about earlier. Seven years ago, PARC was incorporated as a wholly-owned company, which allows PARC to perform leading edge research for Xerox as well as other global clients. PARC researchers are leaders in enterprise computing, services sciences, renewable energy, work practice, and natural language processing linguistics and much more.
- Most of our research to differentiate Xerox's global services and address information explosion, is happening at The Xerox Research Centre in Europe. This center's core competency includes work practice analysis, linguistics, machine learning, and software engineering.

- In the suburbs of Rochester, New York, is the Xerox Research Center Webster. It houses our core competencies in workflow automation, digital imaging, and next generation printing systems. A lot of the Innovation on the On Demand show today has its roots in this research Center,

- Just outside of Toronto is the Xerox Research Centre of Canada, where we focus on materials science and chemical engineering and where we make sure we have state of the art toners, inks and materials in our digital systems. Researchers are also exploring with printing materials well beyond inks and toners.

- In addition to the Xerox Centers, we collaborate closely with our joint venture partner Fuji-Xerox in Japan on several research, technology, product and go-to-market programs.

Open innovation

While we have our own fantastic talent around the world, at the same time, we recognize that there are millions of scientists and engineers in the world. One of the biggest changes I have seen over the last decade is the switch to co-invention, and co-innovation. Research and development is no longer contained within our walls, and networks of Xerox researchers, engineers and value-chain partners are innovating together with Customers.

Let me give you a few examples:

- In Europe, we have more than 40 collaborations underway with the government, universities, and corporations;

- Researchers are collaborating with universities in Canada, Russia, China and India, focused on nanotechnology and services.

- In the United States we collaborate with over 25 universities, one of our recent foundation grants funds MIT graduate fellowships in green technologies and advanced digital technology.

Now that I covered the information explosion and mass Customization trends, and provided some of the Xerox Innovation Context, let's take a look inside some of the products on the show floor and have a look at the exciting technology breakthroughs that have recently come from our labs.

iGen4

We developed and selected the technologies we're working on through a wide variety of ways. Our researchers and practice specialists spent a lot of time in print and graphic art shops. They examined and mapped out in detail how customers are really using digital technologies – ours and our competitors. We hosted customers at a multitude of thought leadership workshops at our Gil Hatch Center for Customer Innovation in Rochester and in our technology showrooms co-located with all the research centers.

We also piloted early versions of products, software and services in customer sites to learn what worked, what didn't and what was missing.

Not surprisingly, we confirmed that customers want the right color and image quality when they first print a file, and that they want the same quality - time after time - with little or no intervention on their part. And we also heard you say that productivity is much more then the rated print speed of a digital press Productivity also reflects the workflow, the reliability and the operability of our systems.

Well we listened closely and dreamt together and created what we think -- and our customers are telling us -- is an impressive set of new technologies in our iGen4 color cut sheet digital production press.

We invented and commercialized a series of new quality controls to provide superior image quality and increased running time; leading to an increase in customer productivity.

As an example, let's take a look at the sensors and calibration tools that have made the iGen4 even more of a technological marvel.

As you can see, dreaming with our customers lead us to a breakthrough set of technologies for the iGen4 and we hope that you are dreaming with your customer about how to use these digital capabilities to enable mass customization or other new and differentiating applications.

Inside the labs: Concept Color 220

At drupa last Fall, we provided a sneak preview of a color digital press we call Concept Color 220- harnessing two color print engines. We are now working on expanding this tandem or modular architecture to the iGen4 …making it the fastest, full-color, cut-sheet digital press. This is another technology set that came from extensive dreaming with our customers. When we described this concept to customers we heard three resounding themes.

- First, print-shop owners like the idea of getting more productivity in a smaller footprint.
- Secondly, customers simply loved the idea of using the second engine to provide not only productivity but also redundancy. When one engine is down, the other engine can still print and get the job done while service is on the way.
- And finally, customers don't want to deal with the complexity of managing multiple engines. The image quality matching and the timing between the two engines had to be done automatically with no intervention on the customer's part.

This insight led to our first multiple engine press: the Xerox Nuvera 288 Digital Perfecting System, a twin-engine monochrome press which we unveiled at On Demand 2 years ago and which won multiple awards. And because we dreamt with our customers we also included our unique pass-through programming software to keep one engine running at full speed, even if the other one stops for service or to replace toner.

Building on these technologies, the ConceptColor 220 integrates two iGen4 engines in-line into one system. It prints 220 duplex pages per minute and features front and back full-color matching. The press is designed for heavy use and can approach a monthly print volume of up to 7 million color cut sheet pages. The technology happening inside to match colors seamlessly and provide redundancy is absolutely astounding.

With the ConceptColor 220, printers and publishers can achieve greater economics by getting twice the duplex speed and twice the productivity with a single operator, saving time and labor. The system also has a smaller footprint and is more compact than two separate Xerox iGen4s.

This is still a technology project in our labs and we have not yet determined when the Concept Color 220 might come to market or exactly what features it will include, but as we continue to dream with our customers, we know that real productivity advances through both speed and uptime improvements are key to your business.

Solid ink advantage

Another research area we are investing in heavily is in support of our unique Solid Ink technology roadmap. Customers love Solid ink because of the vivid colors, the simplicity, reliability, the reduced cost of ownership, and the fact that it is low-waste.

In fact, printing 100,000 pages using solid ink, creates only 5 lbs. of waste, less than 5 % of the waste produced by laser printers. Less waste means less components and packaging to manufacture transport and recycle. That means that solid ink printers and multifunction devices have a significantly lower carbon footprint then laser printers.

Solid ink for high speed office

We are now taking the advantages of solid ink to the next level. Researchers and engineers have developed a very robust print head that will allow high speed solid ink printing. Faster print speed enables Solid Ink to be used in higher volume offices for large workgroup A3 applications.

We will soon launch a new solid ink multifunction device that is faster, easy to use and provides considerable cost savings. It will deliver all the expected features and functions of a laser multifunction device with the added benefits of lower lifetime cost and better sustainability attributes.

When we dream with our print customers about new technologies for production we hear you say that you want the simplicity of inkjet and the powerful capabilities of laser printing. Based upon that feedback, we are extending the advantages of solid ink to production.

The technology is still in the research phase but it is clearly an innovation that will take inkjet beyond the products and applications available today.

And that's not all…we are already looking beyond solid ink to a cured gel ink that will extend the range of materials we can print on and, hence, open up many additional packing applications.

Now that I have given you a peak into some of the mass customization technologies, let's move on to workflow.

Work flow

I don't have to tell you how large and complicated your digital publishing print jobs are, especially your mass customization jobs. But I will tell you about some of the workflow software we are creating that enable effective print job management and more easy personalization and mass customization. Our researchers have developed a number of automated capabilities that streamline your production processes.

Lean Document Production

Printing businesses are seeking ways to re-engineer themselves to enable profitable growth and effectively transition from offset to digital publishing; from mass production to mass customization.

Let me start with yet another example of the power of dreaming with our customers. One of our researchers was exploring technologies to improve the media handling in our printers using robotic design principles and methods. But as he went out to print shops he observed that customers had an even bigger pain point – the print shop owners needed to be far more efficient, not only at how paper was handled in the printer, but at how jobs where managed in the print shop itself.

As a result we have developed a remarkable process; it is protected by more than 60 patents. We call it Lean Document Production. It is a pioneering set of software tools and a unique method to optimize and manage print shops more efficiently and effectively than ever before. Let me show you.

This is just one more way that we are helping our customers work better, smarter and faster. The Lean Document Production process is state of the art and well respected by operations research experts. It was a finalist for the Franz Edelman Award… the top international award for operations research.

Lean Document Production is just one of many examples of how we integrate the principles of Lean Six Sigma into nearly everything we do, both inside our company as well as in the services we offer our customers.

Easy personalized imaging

Mass customization means that each and every single page can be different. As a result, the printer itself is not the productivity limitation, but making the personalized images is. XMPie, a Xerox wholly-owned company, has developed a unique technology that inserts data and logic to create powerful, personalized cross-media communications. This enables you to leverage your valuable customer data and create quickly personalized printed brochures, emails, Web sites, videos and analysis. It has been shown that individuals will pay significantly more attention and will respond more frequently to targeted personalized marketing campaigns.

Our researchers are currently collaborating with XMPie and Purdue University to develop software that will fully automate the process of creating sophisticated personalized images through advanced algorithms that will eliminate the need to set up each master image.

Simplifying document creation

One of the major breakthroughs in computers and printers was WYSIWYG, -- What You See Is What You Get.

In fact, it was a phrase coined many years ago at Xerox's Palo Alto Research Center. Until then, you couldn't be sure that what you saw on the computer screen was what would be printed. For print shops, there are still uncertainties. What will the project look like if it is spiral bound? Or if tabs are inserted? Will the layout, which looks good in two dimensions, work in three dimensions?

We have developed a document visualization tool that will let a print shop display the finished job in three dimensions, page-by-page. Let's take a look.

This software will enable print providers to collaborate easily with customers, including remote customers, before a single page is ever printed. It is the ultimate in WYSIWIG for the print shop and eliminates wasted test documents and wasted time.

DocuShare

As commercial printers you deal with enormous files. Providing a secure, accessible, searchable home for those very large files -- or files of any size -- is the focus of what we call DocuShare: a Web-based enterprise content management software solution.

Initially invented and piloted in our research labs, the DocuShare family of software products has a very robust and simple to use storage and sharing capability. At Xerox, we use it daily to share information globally among our engineers and with partners. With several million seats in use, the DocuShare software helps businesses to easily and globally share office files, documents, photos, videos and more.

Let me give you a couple examples:

- A few years ago we worked with NASA to help them store and access hundreds of thousands of photos, project files and research data from the Mars Rover exploration. You can imagine the security and file size requirements for such a project.
- Recently, the Oklahoma Employment Security Commission boosted productivity by up to 35 % after implementing a paperless claims workflow process using DocuShare. Instead of manually storing and retrieving employment, insurance and tax data, workers now instantly access more than 2 million files. It used to take days to search for a claim file, now it takes minutes.

With that, let me switch topic areas to show you some of our initiatives aimed at sustainability.

Sustainability -- A long history of commitment

At Xerox we have taken our responsibility as world citizens very seriously for many decades. More recently, in 2002 we began our Energy Challenge 2012 program with the goal of lowering our absolute worldwide greenhouse gas emissions by 10 % from 2002 to 2012. By 2007 we had already over achieved and then boosted our target to 25 % reduction worldwide.

In addition, we have prevented more than 2 billion pounds of waste from reaching landfills through our long-standing green initiatives. We have been recognized by a number of organizations as well as by the U.S. Environmental Protection Agency as a climate leader and pioneer.

We are focused on developing green products and services. Our offerings are enabling the printing industry to embrace green printing solutions. The iGen4 for example, emits 80 % less noise than a typical offset press. Its dry inks are non toxic and emission free, and 97 % of its components are recyclable or remanufacturable. We are also constantly focused on developing more energy efficient systems.

But there is even more. Let me show you how the research teams are contributing to our sustainability initiatives.

Energy-friendly toners

Earlier this decade we introduced a new breakthrough Emulsion Aggregation toner, called EA toner. This toner combines better image quality and lower cost with improved environmental impact.

We are able to control the shape and properties of the EA toner precisely, because we grow it starting from nano-scale particles. To create conventional toners, we ground down large blocks of materials to create smaller, random shaped toner particles.

We recently announced our new generation EA toner in the Xerox 700 Digital Color Press. This new toner has a significantly lower melt temperature – nearly 45 degrees lower – which means that the energy needed to print a page is much less.

The process for making the EA toners themselves is also lower energy then the conventional toner process; and since the particles are smaller, less toner is required per page. This results in an overall win-win for sustainability.

Nano-technology: improving printing performance and reliability

We are building on our nano-engineering knowledge in making EA toners, to also improve the reliability of our systems.

Let me give you 3 examples:

- We are exploring ways to create fuser surfaces that wear up to 5 times slower than current fusers while at the same time conducting heat 10 times better.
- We are creating photoreceptor surfaces which will heal themselves by releasing chemicals that seal cracks or other defects.
- And we are inventing transfer belts and charge rollers that don't get dirty because they repel all particles and oils that touch them.

These are difficult research challenges and the technologies are not ready for prime time yet, but at Xerox we are here for the long haul and want to be an environmental leader by investing heavily and getting these technologies into your hands as soon as possible.

High Yield paper

One not so good consequence of information explosion has been a significant growth in the use of paper. Many of us assumed that a networked office would be a paperless office. It turns out the opposite is true. The emergence of the Internet increased paper consumption by 40 %.

- The number of pages printed in production and office combined per year is more than 32 trillion pages worldwide .
- In the U.S. alone, we go through more than 700 pounds of paper per person each year… that is 4 times a typical person's body weight in paper.

Wow, so much paper. We started investigating ways to minimize the impact of all this paper usage. A year ago, Xerox introduced a first-of-its-kind paper for digital printing that uses half as many trees as traditional paper and lowers the cost to mail printed material due to its lighter weight.

We call it High Yield paper, because it uses 90 % of the tree while traditional paper making processes use only 45 % . In addition, High Yield Paper requires less water and chemicals to produce resulting in a more sustainable manufacturing process. This paper is on the market today. In fact, it is the only paper I use.

Reusable paper

I am even more excited about another research project we currently have underway. But before I talk about it, let me share some facts.

- Our work practice specialists observed that office workers throw away almost half of everything they print within 24 to 48 hours after printing
- Examples of the most popular one-time uses are drafts of documents; hardcopies for meetings; email attachments, and other temporary documents such as driving directions or daily calendars.

As we dream with our customers we hear over and over that you prefer the look and feel of paper, but for environmental reasons, you would like to use less of it. In response, scientists at our Canadian research center, and at the Palo Alto Research Center, have invented a novel re-usable paper printing technology. You print today and a few days from now the paper is blank again and can be re-used.

This is still a research project and more invention is required. The goal, however, is to enable you to print out documents, use them as long as you want, then use that paper over and over again. No more inks, toner or wasted paper. This means lower cost for you, and good for the environment. Of course, we at Xerox still need to figure out how to make money with such a device.

PARC Clean Tech innovation program

Our investments in green technologies go well beyond making a difference inside our own operations, or driving green solutions for our customers. We are solving big problems that will significantly benefit the world if successful.

Three years ago, PARC launched its Clean Tech Innovation Program. Clean Tech refers to renewable, sustainable and environmentally safe technologies.

Because the main obstacle to the widespread adoption of clean technologies is cost, PARC researchers have been focusing on cost-effective solutions. Some current initiatives include:

- Applying PARC’s optical systems and ink-jet technologies and competencies to develop low-cost high-efficiency solar concentrators.
- Applying particle manipulation expertise to create compact and low-cost water filtration systems. this concept uses a spiral set of tubes to produce clean water in a very cost effective way. This could be used in crowded cities with little room for filtration plants and in parts of the emerging world.

There are many others, and if you are interesting in partnering with PARC in these Clean Tech programs please do contact us. Much more info on these CleanTech technologies can be found on PARC's Web pages.

Printing – beyond inks and toner

Next, I would like to share another exciting project that has grown out of Xerox's depth of knowledge and experience in ink-jet printing and in fabricationg organic semiconducting photoreceptors.

Lots of progress has been made in developing e-readers such as the Amazon Kindle or the Sony eReader. Both however, still have Silicon based electronics and hence are expensive and not flexible.

Researchers in Canada and PARC have been inventing printable materials: conductors, semiconductors and dielectrics that will enable the fabrication of plastic transistors at low temperatures in non-vacuum conditions. Leveraging such materials will enable lighter, flexible and less expensive e-readers.

We are continuing to explore ways to move this project from the laboratory to the market and are looking for partners to do so.

PARC (DARPA)

Our expertise in printing plastic electronics is also being applied in another important project PARC is doing in collaboration with the government. We are creating a chip on a small plastic sticker that can track the cumulative impact of blast forces.

This project could make a huge difference to our armed forces.

A recent New York Times article reported that as many as 300,000 or 20 % of combat veterans have suffered concussions. Tens of thousands end up with long term problems like memory loss, headaches, dizziness and light sensitivity. Often the symptoms go undiagnosed.

The idea is that a disposable flexible plastic tape attached to helmets or uniforms stores data associated with blasts.

The information obtained will help the army determine the severity of the blasts on individuals and provide information to help decide when to take the soldier out of the field.

For those of you in the audience who have children playing football or hockey, this would also be a great sticker to add to sports helmets. Having several teenagers myself, I can't wait for this to be commercially available.

I gave you a peak into the labs, sharing technology, workflow and sustainability projects that are still customer dreams but which we hope to turn into critical customer assets in the future.

Future of work

Let me end with some final thoughts about the future, especially the future of knowledge work.

As we all know, mobile communications is dramatically changing the way work gets done. Many more people are working at home, in airplanes, coffee shops or convention centers.

For the mobile and remote workers who depend on portable and wireless devices, access to the right and appropriate information is a big pain point.

In order to turn this challenge into an opportunity our work practice specialists are studying mobile workers, such as field technicians and sales people.

We are applying our knowledge in natural language processing, computer science, data mining, and social sciences, to develop technologies that enable the mobile worker to easily get to just the right information at the right time.

You have already seen changes in device capabilities such as the iPod or tablet laptops. During the next few years the human interactions with computers will become more natural using speech recognition, touch, handwriting and even gestures.

Imagine for example technologies that will let me know, while I stand here, who all is in my audience, and who I should be especially aware of, what types of questions you might have and how to best answer them.

Imagine technologies that can help me prepare for a trip with not only the logistical details of my flight, hotel etcetera, but provide knowledge about the customers I will be meet, what their pain points are and how I can help them… before I even meet them. All of this will become a reality. How do I know? Just as in 1975 the director of PARC knew how the office would look like in the late 20th century. I know because Xerox researchers are creating this future today.

Business Week – businesses of tomorrow

So, if the Business Week cover of 1975 forecasted a computer on every desk, and Business week more recently forecasted a socially networked world driving businesses innovation -- what will the Business Week cover in 2020 look like?

The next decade will certainly be impacted by a variety of emerging technologies:

- Moore's law is expected to increase the processing capabilities of microprocessors by a factor of 1,000.
- Broadband transmission capabilities will continue to improve exponentially.

These improvements are huge and will enable many things not possible today. Let me tell you about a few:

- Imagine computers embedded everywhere in the environment, in clothing, walls, furniture, buildings, etcetera .
- Imagine wireless RFIDs embedded in our bodies such that secure, personalized and proactive healthcare becomes a reality… Wearable and implanted computers will become more widespread.
- Imagine being able to walk the floor of a show like this one with a thin flexible display in your briefcase or rolled up under our arm. When you need information, you roll out your lightweight color screen, and using simple hand gestures play interactive videos about the cool technologies behind the products you're interested in.

- Or better yet, you can experience 3D virtual reality through your glasses or contact lenses and just “see” the information you are looking for. Imagine glasses that would help deaf people hear or interpret the world for blind people via speech.

- Imagine that for most business transactions or information inquiries you will deal with computers or simulated virtual people.

Computers will help us remember, think and reason. While today most of the Web’s content is designed for people to read, in the future, with the help of many around the globe, tireless computers will be able to read and manipulate zettabytes of information. Computers will be capable of learning and creating new knowledge entirely on their own. By scanning the enormous amount of content of the internet computers will know every single piece of public information.

So imagine brainstorming with a robot that has access to all of the recorded knowledge around previous inventions? You could talk to a machine that has access to all the laws, – that could argue legal cases?

With such human/computer collaborations we will be able to find cures for diseases more rapidly or resolve court cases and bring individuals to justice more quickly.

How do I know? I know because Xerox researchers are experimenting with these emerging technologies today.

We are dreaming with our customers and collaborating with partners across the globe. There is no doubt in my mind that there will be a future in which information is easy to create, easy to use, easy to find, easy to share, easy to manipulate, and easy to comprehend and use in many beneficial ways. Information overload will be a thing of the past.

With the research being done around the world we are taking steps toward that future today. It’s going to be a fascinating ride, and the exciting aspect about being here, is that many of you are also creating that exciting future for your customers today.

Thank you and enjoy the rest of the On Demand conference and show.