The Next 5 in 5

IBM's 2nd annual **Next 5 in 5** is our forecast of the five innovations that will change the way we live, work and play in the next five years. Our predictions range from super-smart cell phones to total traceability of everyday foods. The five innovations selected were based on projects in our research labs, insights from our business think tank and ideas from employees around the world.

This year's predictions pick up some threads from **last year's**: a continued exploration of the use of avatars, increasingly sophisticated mobile phones, and nano-technologies to address environmental concerns.

Doctors with super powers

3-D representation of the human body

Envision this…when you visit the doctor, your 12-inch stack of paper medical records will have morphed into a walking, talking avatar, a 3-D representation of the human body.

Your doctor can "click" on a specific part of your avatar's body, such as the heart, and instantly see all of the available related medical history, including text entries, lab results and MRIs.

Going even deeper, they can then access 3-D visualizations and audio clues of the heart—at a scale and resolution beyond anything they can view today—to better understand your ailment. The computer will automatically compare those visual and audio clues to thousands or hundreds of thousands of similar patient records, and be much more precise in diagnosing and treating you. The explosion of medical information and emerging visualization technologies that were once the sole domain of supercomputing geeks will transform how doctors diagnose and treat you right in their office.

In effect, doctors will gain superpowers: technologies to allow them to gain x-ray like vision to view medical images, super-sensitive hearing to find tiniest audio clues in your heart beat, and ways to organize information in the same way they treat a patient, by using the human body as a metaphor for a filing cabinet.

You are what you eat

Your food will have a digital passport

Eat an apple today and you know it came from the grocery store. Eat an apple five years from now and you could know it was grown on a 5th generation Cortland apple tree in Oregon, was never treated with pesticides, was picked on July 6th, traveled by air-conditioned truck to your local farmers' market and has 65 calories.

Your food will have a digital passport: Using second-generation barcodes, wireless tags like RFID, and specialized sensors, you will have access to detailed information on your food from its origins and transportation conditions to its final destination. Additionally, you will know how its production impacted the environment, so you can make purchasing decisions based on how eco-friendly products are.

Your shopping cart will be smart: When you put an item in your shopping cart, it will read the digital passport of your food using a network-connected device. For example, if you are on a diet that calls for grain-fed meats, you can find that information instantly by simply placing a package of meat in your cart.

Loyalty cards will become an early warning system: Using loyalty cards, grocers will be able to instantly tell you—by e-mail, text message or phone call—when items are recalled, alerting you that the food in your refrigerator should be tossed and crediting your account.

Going green

Manage your own carbon footprint

Everyone talks about going green. Soon, with a new range of "smart energy" technologies, you can walk the talk... and manage your own carbon footprint.

In the next five years, you might get this call on your mobile: "*It's your air conditioner calling, you left me on and nobody's home. I'm wasting energy. Would you like to turn me off?*" IBM is working with CenterPoint Energy of Houston to install two million Internet-enabled electric meters that will allow consumers to control appliances via a Web browser or cell phone when they are away, saving time, money and energy.

Technology will provide you with up-to-date reports of electrical usage, so you can monitor how much money you are spending and energy you are using, just like you can track your cell phone minute usage today. With this information, you can tell your electrical provider how much carbon output you are willing to live with each month or how much money you are willing to invest, and the best times to run your appliances.

In addition, IBM is working to make solar energy more accessible by developing a new way of repurposing scrap semiconductor wafers into a form that can be used to manufacture solar panels.

Commuting your commute

Cars that drive themselves

Commuting will improve as technology steers us clear of congested roads. While there is more technology embedded in our cars, a coming wave of connectivity between vehicles and roads will advance the way we drive—and ride—forever.

Relieving congestion: Intelligent traffic systems will adjust the lights and signals in real time, controlling the speed and directing the flow of cars to less congested routes. Sensor technologies, GPS and satellites can provide drivers with information to help them choose the best routes during peak travel times. Stockholm has already reduced peak hour traffic by 20%. The predictive traffic system in Singapore is nearly 90% accurate. In the next two years, IBM is helping New York develop a road congestion charging system as well.

Cars with reflexes: Your car will be equipped with sensor technology to communicate with other cars and sensors along the road. They will be able to

sense and respond to dangerous conditions, such as black ice, and navigate to faster, alternate routes.

Calling all straphangers: If you commute via train or bus, your cellphone will send you up-to-the-minute arrival and seat availability information, expected travel time as well as alternate routes.

Your cell phone, yourself

You can't live without your cell phone now? Just wait.

In the next five years, it will become your banker, ticket broker, concierge, shopping buddy, [and appliance manager if you read section 3]. In short, it will be your new best friend.

If your friends can't make a shopping trip, you can bring them along, not just by texting each other, but by connecting them into the experience. Technology will allow you to snap a picture of someone wearing the coolest new outfit and then search the Web for the designer and the nearest shops that carry it. You can then see what that outfit would look like on your personal avatar—a 3-D representation of you right on your phone— and ask your friends in different locations to check it out online and give their opinion. When you go into a store, your phone can guide you to where the outfit would be located, with discounts to match your preferences.

Also in development:

- In Singapore, **CASSIS International** and IBM are piloting a Smart Poster Management System at train and bus stations. Consumers just need to tap on a Smart Poster with their phone to receive information, access services and conduct transactions like buying movie tickets.

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