

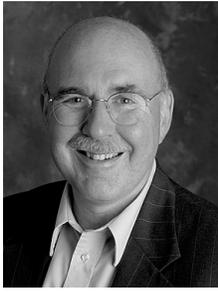
MAY 2001

T H E F O R R E S T E R R E P O R T

## The X Internet

FORRESTER®

# FORRESTER



By Carl D. Howe

With George F. Colony

Bill Doyle

Christopher Voce

Rebecca Shuman

#### Headquarters

Forrester Research, Inc.  
400 Technology Square  
Cambridge, MA 02139 USA  
+ 1 617/613-6000  
Fax: +1 617/613-5000

[www.forrester.com](http://www.forrester.com)

**FORRESTER®**

## The Forrester Report

---

MAY 2001

# The X Internet

The Web's days are numbered. So what's next? The X Internet, which boosts online users' quality of experience and accelerates the number of connected devices.

## 2 MARKET OVERVIEW

- The Web is fading.
- The Internet still ignores most of the real world.

## 6 ANALYSIS

- An executable Internet will create new, more compelling experiences for people.
- An extended Internet connects users with the real world.

## 15 ACTION

- Don't get stuck on the Web.
- Start wiring for wireless.

## 16 WHAT IT MEANS

- Firms will tap into the open source movement.
- X Internet devices will number 14 billion in 2010.

---

## 18 RELATED MATERIAL

- Online spreadsheet underlying the X Internet sizing forecast.

---

## 19 GRAPEVINE

---

## 20 ENDNOTES

## MARKET OVERVIEW

---

### Web-Centric Thinking Hinders The Internet

People are confused: Many think the Web is the Internet because the Web has been so successful. But the Web and the Internet are different -- and the Web is only one step in the growth of the Internet.

---

#### THE MAINSTREAM INTERNET

The Internet has come a long way from its roots as a government-sponsored, communications research project. As the year 2001 dawned, the Internet hosted more than 100 million computers and more than 400 million users worldwide.<sup>1</sup> And why not? Look at what the Internet has provided to its users:

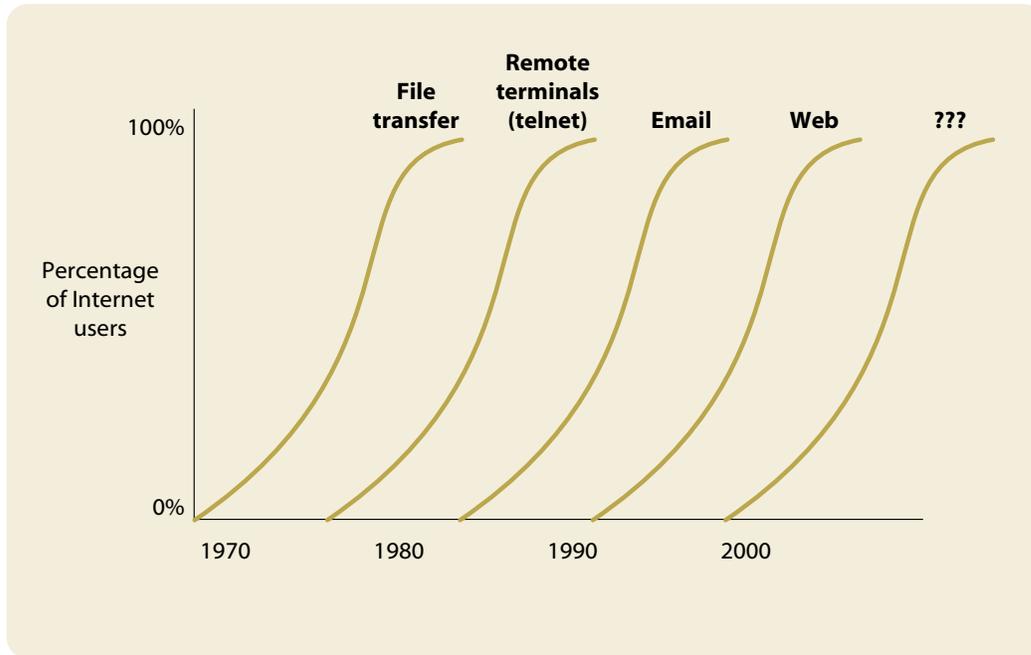
- **Global reach.** The Internet today connects users and servers in every country in the world.
- **Access to most companies.** All US corporations with more than 1,000 employees have some type of Internet connection today.
- **An abundance of content.** Internet users today have access to everything from pictures of Egyptian artifacts to data from the International Space Station.

#### The Internet's Killer App -- The Web

A long string of Internet applications has fueled the Internet's boom (see Figure 1). Businesses and consumers first took notice of the Internet after Marc Andreessen and Netscape put a point-and-click interface on the World Wide Web protocols that Tim Berners-Lee invented in 1989. With a user interface that schoolchildren and CEOs could understand, the Internet finally got attention outside the realm of computer geeks. The results:

- **More than 1 billion Web pages.** Today, researchers at the University of California, Berkeley, estimate that there are about 4 billion static Web pages -- and that's just the surface. When we look at Internet information contained in databases accessible via the Web, firms like BrightPlanet.com estimate that this dynamic Web content amounts to more than 600 billion pages or 7.5 petabytes of information.

**Figure 1** The Web Is Just The Latest Internet Application



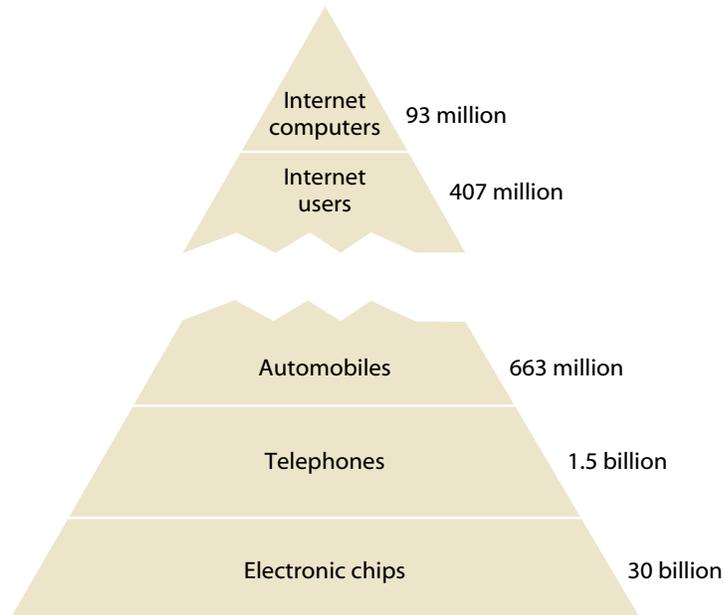
Source: Forrester Research, Inc.

- **Booming eCommerce.** In 2000, US eCommerce exceeded \$480 billion -- and it's projected to grow to more than \$3.1 trillion in 2004 (see the April 18, 2000 Forrester Brief "Global eCommerce Approaches Hypergrowth").<sup>2</sup> This phenomenon is not confined to the US -- global eCommerce will hit hypergrowth this year, breaking the \$1.2 trillion mark and reaching \$6.8 trillion in 2004.<sup>3</sup>
- **A thriving job market.** A recent study showed that the Internet is responsible for more than 3 million jobs today -- that's 60,000 more jobs than the insurance industry and twice as many as real estate.<sup>4</sup>

### **BUT THE WEB IS FADING FAST**

The 1990s euphoria built on an always-expanding Web got a reality check in 2000. Despite booming Internet use, today's New Economy still pales next to the size and scope of the real world (see Figure 2).<sup>5</sup> Now that the novelty of reading *People* online has faded, business executives and consumers are returning to reading magazines, watching TV, and seeing plays. Why? Because they tire of the Web's:

Figure 2 The Gap Between The Internet And The Real World



Source: Forrester Research, Inc.

- **Unsatisfying sites.** Today's Web sites create terrible user experiences. Of 117 B2C sites that Forrester reviewed in 1999 and 2000, the average user-experience score received was -3 on a scale of -50 to +50 -- where +25 represents a passing grade (see the December 2000 Forrester Report "Scenario Design").<sup>6</sup> And B2B sites are no better -- of 30 B2B sites reviewed by Forrester, the average score received was -9 (see the December 1999 Forrester Report "Why Most B-To-B Sites Fail").<sup>7</sup>
- **Content-free content.** When Forrester surveyed more than 5,000 online consumers regarding online content, we found there was no type that even 10% of our interviewees were willing to pay for (see the December 2000 Forrester Report "The Content Site Turnaround").<sup>8</sup> Across all content types, only a quarter of respondents said that online content was "good" or "very good." The bottom line: Today's Web isn't good enough to pull money out of consumers' pockets.
- **Flat experiences.** Sock puppets and Super Bowl ads paid for with venture capital couldn't save the likes of Pets.com and eToys. Why? Because once the novelty of online shopping wore off, most Internet retailers couldn't offer a rich enough experience to compete against the familiar experience of real-world shopping -- as the nearly 25,000 employees laid off by US dot-coms in the first two months of 2001 will attest.<sup>9</sup>

### The Root Problems Of Today's Internet

The Internet still retains seeds of ongoing, sustained growth. But for it to reach this potential, the Net must overcome three root problems:

- **It's dumb.** Static Web pages presenting news, sports, and weather hardly improve the same content presented on paper -- nor do they take advantage of the powerful computing systems delivering them.
- **It's boring.** With the bulk of Internet use coming from fetching static Web pages, today's Internet experience is more like reading in a dusty library than basking in the birth of a new medium.
- **It's isolated.** Today's Internet is so remote from the real world that the media calls it by a different name -- cyberspace.

## ANALYSIS

---

### The X Internet Will Overtake Today's Web

The Web was about connecting people to computers through browsers. But two new waves of innovation will eclipse the Web: an executable Net that greatly improves the online experience, and an extended Net that connects the real world. The result? The Internet moves to a second round of expansion.

---

#### THE X INTERNET LOOKS BEYOND THE WEB

The Web boom is dead, and users know it (see the Forrester My View "X Internet").<sup>10</sup> But Forrester sees two waves of Internet innovation that will supplant today's dead Web and grow the Internet to billions of devices (see Figure 3). The two waves we see are:

- **An executable Net that supplants today's Web.** Code moved to user PCs and other devices will captivate people in ways that static Web pages never could.
- **An extended Net that connects to the real world.** Smart devices will push the scale of the Internet far beyond today's PC-based Net.

These new applications will drive change in three areas:

- **How applications get built.** The executable and extended Internet will rely on new combinations of hardware and software.
- **How people use the Net.** These systems will change how users view the Internet and what they expect of it.
- **How firms do business.** These changes will drive invention -- and the creation of new companies to profit from those inventions.

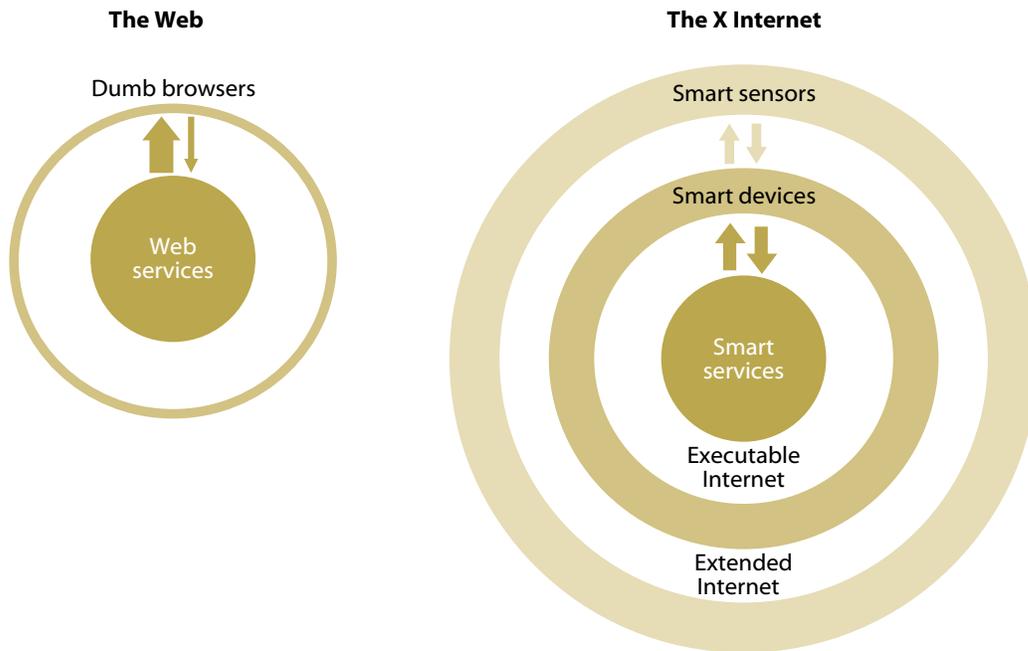
#### THE EXECUTABLE INTERNET PUTS INTELLIGENCE NEAR USERS

Forrester defines this first stage of the X Internet as:

*Intelligent applications that execute code near the user to create rich, engaging conversations via the Net.*

The Web brought users pages to read. The executable Internet will deliver interactive experiences.

**Figure 3** Two Waves Of Innovation Will Supplant Today's Web



	The Web	Executable Internet	Extended Internet
<b>Number of devices</b>	Millions	Hundreds of millions	Billions
<b>Focus</b>	Browsers	User-focused software	Devices
<b>Killer app</b>	Web, IM, eCommerce	Responsive experiences	Real-time business apps
<b>Data</b>	HTML, XML	Executables and XML	Environmental data
<b>Model</b>	Server-centric	Peer-to-peer	Device-centric
<b>Connections</b>	User-driven	Opportunistic	Opportunistic
<b>Time frame</b>	1993 to 2001	2001 onward	2005 onward

Source: Forrester Research, Inc.

Imagine that you are building a house (see Figure 4). The Web would deliver documents to you that tell you how to build the house. Ask about framing a window, and you get an article telling you how to do that. But when you move on to installing a faucet, you have to ask for and read a different article about how to install plumbing.

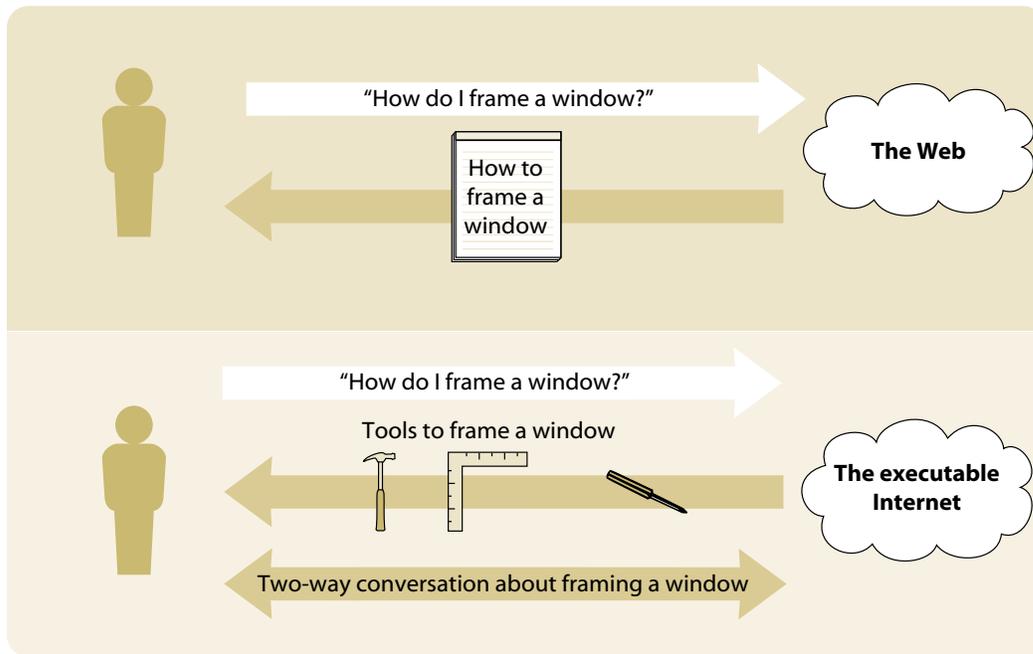
Now imagine building that same house, but this time with the executable Internet. When you want to frame a window, a carpenter shows you a level, a hammer, and a carpenter's square, and guides you step by step through the process. Instead of reading a book, you have a conversation about the work you're trying to do. When you move on to installing a faucet, the carpenter disappears, and a plumber appears with his tools. By having an intelligent conversation instead of reading a book, you can build your house faster, with higher quality and precision.

### Executable Internet Applications Get Built In Four Pieces

The executable Internet isn't completely new -- it's a specific mix of software and standards available today. In fact, users can see glimpses of the executable Internet in applications like Napster or SmartMoney.com's Map of the Market. But complete executable Internet apps will consist of four pieces:

- 1) **Smart code.** Software like Java allows users to download code from the Net and run it locally without security fears. Executable Internet apps will use downloaded code to enhance the user experience with pop-up menus, pick lists, graphics, and simple calculations. A sales manager at autodealer giant AutoNation might run an executable Internet application from Bank of America locally to evaluate whether she should extend her firm's credit line to finance its growing auto inventory.
- 2) **Data conversations.** Code downloaded to user PCs will talk back and forth with services in the network using self-describing data in the eXtensible Markup Language (XML) standard. The benefit? The user's PC can talk with any other computer on the Net, regardless of whether it's a PC or a mainframe. When the AutoNation sales manager tries to forecast her credit needs for the upcoming year, her executable Internet app can fetch her dealers' order histories from General Motor's IBM mainframe and Ford Motor Company's Sun Microsystems server.
- 3) **Service locators.** Just as house builders might use a person-to-person referral system to find a plumber, executable Internet apps use online location services like search engines and peer-to-peer referrals to find new Net services. A location service at GM helps the AutoNation sales manager find GM services that might affect her planning process for the year.

Figure 4 The Web Versus The Executable Internet



Source: Forrester Research, Inc.

- 4) **Services in the network.** Net-based services deliver new content -- and new executables -- to users when they need it. Once our sales manager discovers GM's services, she can use GM's executable sales modeling application to see how its new pricing and incentives will affect her forecast.

### People Use The Executable Internet For Better Experiences

Forrester predicts that the executable Internet will become the dominant way users interact with the Net by 2005. Why? Because downloadable tools that assist users and allow Internet conversations will:

- **Eliminate the worldwide wait.** An Amazon.com customer who wants to buy four CDs will no longer have to wait for eight pages of text and graphics to flow to his screen. Instead, users can employ the same drag-and-drop skills they learned on the Windows desktop -- and take seconds rather than minutes.
- **Create experiences comparable to video games and TV.** User PCs will no longer sit idle while pictures download from remote servers. Technologies like Curl's new executable content language will generate fluid animations on the user's machine -- allowing a buyer to navigate a virtual marketplace like Enron's energy trading market as easily as playing a game of Doom.

**Figure 5** X Internet Vendors

Executable Internet vendors	What they provide
Hewlett-Packard, Microsoft, Sun Microsystems	Java and Windows execution platforms
Altio, Consilient, Droplet, Eazel, Fourbit Group, Microsoft, NetGratus, Zaplet	XML-based executable development platforms
Curl	Executable media language
IBM, Microsoft, Ariba	Machine-to-machine services locators
American International Group, Dun & Bradstreet, eCredit.com	Business services in the network
Extended Internet vendors	What they provide
Dallas Semiconductor, DPL Group, Hewlett-Packard, Internet Telemetry, Medtronic, Motorola, NetBotz	Internet-connected sensors
NetAcquire, WhereNet, Echelon, Metricom	Networks for collecting sensor data
iVita, OnStar, Networkcar	Extended Net applications and services

Source: Forrester Research, Inc.

- **Simplify users' technology burdens.** Because it is downloaded as needed, executable Internet code can be updated and managed by professionals instead of relying on users to install it. So when Charles Schwab & Co. wants to introduce a new version of its executable online trading system, it just updates the server -- and every user gets the new version the next time she uses the service.

### The Winners: Our First Take

It's too early to pick the sure winners and losers in the executable Internet. But our bets ride on vendors that can market successfully to software developers (see Figure 5). Our picks follow the four components of executable Internet applications:

- **Smart code: Sun and Hewlett-Packard.** The only cross-platform, executable environment in place today is Java. As the executable Internet takes off, millions of Java Virtual Machines like Sun's HotSpot VM and HP's chaiVM will pop up. Why not Windows executables? Some executable Internet apps will be piloted as Windows components -- but viruses and Trojan Horse software will drive developers to systems that have built-in security models like Java has.

- **Data conversations: startups like Altio, Curl, Droplet, and Eazel.** These firms have created drag-and-drop tools that can turn data conversations into user experiences. Each of these firms has specific features, but Forrester expects the successful ones to be bought by today's software giants like IBM, iPlanet, Microsoft, and Oracle. Why? Because these big companies already have relationships with developers -- and the deep pockets needed to market to them.
- **Service locators: vertical industry eMarketplaces.** IBM, Microsoft, and Ariba have already launched directories to locate online business services using an emerging standard called UDDI. But running business directories isn't the core business of these technology companies. Instead, Forrester sees this function becoming an industry-specific service run by vertical hubs like e<sup>2</sup>open or CheMatch.com as the eMarketplace business consolidates (see the August 2000 Forrester Report "The eMarketplace Shakeout").<sup>11</sup>
- **Services in the network: businesses specializing in Internet transactions.** Companies like Dun & Bradstreet, eCredit.com, and American International Group are already creating business-based services like real-time financing and credit that are priced per transaction -- and they'll work better with executable Internet technology. Expect downloadable apps that mirror D&B's Risk Assessment Manager or ClearCross' Landed Cost solution to spark business use of executable Internet apps -- and to convince firms that they don't have to buy software to use these services.

## THE EXTENDED INTERNET CONNECTS THE REAL WORLD

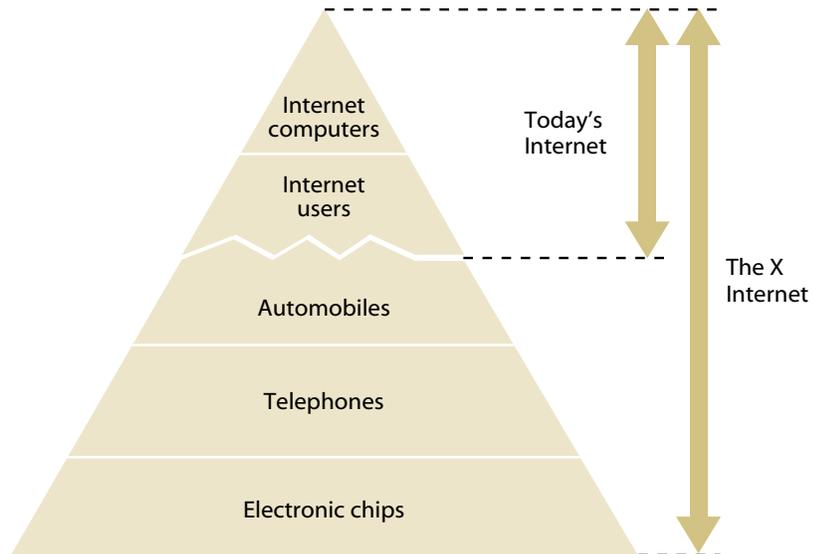
The X Internet is not just executable -- it's also extended. Forrester defines the extended Internet as:

*Internet devices and applications that sense, analyze, and control the real world.*

Let's return to building our house. In New England, we try not to leave our houses unattended in the winter. Why? Because if the furnace ever goes out, the house freezes, the water pipes burst, and the house floods when the ice melts.

But what if houses had Internet-connected thermostats? When the weather gets cold, homeowners could check and adjust their house temperatures from thousands of miles away any time they were on the Internet. Both homeowners' and service providers' computers could monitor house temperatures and optimize comfort and energy use. Some electric utilities might even offer lower rates to Internet-controlled homes if they get permission to adjust the home energy consumption during peak usage periods.

**Figure 6** The X Internet Connects More Than People And Computers



Source: Forrester Research, Inc.

These capabilities aren't just an early adopter dream -- the same economics that drove chips into most everyday devices will also extend the Internet to them (see Figure 6).

### Extended Internet Applications Exploit Embedded Chips

Ever-cheaper integrated circuits will drive Internet connections into everyday devices by 2005 -- \$1 chips will have all the power and networking capabilities of a circa-1990 PC. But once the executable Internet has connected users with Net-based services, firms will use the same technology to talk with networked chips. These chips will have:

- **Silicon eyes and hands.** Chip makers like Analog Devices, Dallas Semiconductor, and Texas Instruments already make miniature sensors, microelectromechanical systems (MEMS), and actuators that work via the Internet. By 2005, manufacturers will build MEMS into most electronic devices. Why? Because these tiny chips will let Internet users locate, measure, and adjust everything from fuel injectors to earthmovers -- and do it from across the room or across the country.
- **Opportunistic communications.** Collecting information from these cheap sensors won't require a \$19.95 per month wire from the phone company. Instead, data will be collected via wireless Ethernet links or piggyback on existing connections

like power lines and cellular links. Already, companies like Cambridge Silicon Radio make chips that speak both Ethernet and Bluetooth wireless protocols. By 2005, these chips will cost only a few dollars.

- **Self-configuring networks.** These new Internet sensors will locate services just as the executable Internet did. Technologies like Sun's Jini and Microsoft's Universal Plug and Play will remove the need for users to do anything to connect these chips to the network. So when BP Amoco installs a new Internet-enabled gasoline pump at a filling station, it will start logging maintenance information to the station and to BP Amoco operations without the owner lifting a finger.

### **Business Applications Will Dominate Extended Internet Use**

The big users of the extended Internet will be businesses, not people. Why? Because corporations have the capital necessary for extended Internet deployments -- and will spend that capital if they can forecast a large return on their investment. Some examples:

- **Extended Internet apps will allow executives to optimize assets.** Companies like iVita already have software that helps firms optimize capital assets based on where they are -- all without people having to type in data. For example, radio ID tags allow hospitals to track high-value assets like infusion pumps. iVita's app can alert the hospital's CFO if 50% of those pumps are unavailable simply because they're waiting to be cleaned -- and save thousands of dollars by not buying additional, unneeded pumps.
- **Suppliers will instrument customer sites to boost sales.** Motorola is building agricultural sensors that can collect data on soil properties like moisture and pH. But it will be firms like Dupont that put them on farms. Why? Because with continuous monitoring, Dupont can ensure a near-perfect corn crop to farmers using microcustomized fertilizer -- and charge a higher price for that service (see the January 2001 Forrester Report "Custom Chemicals Materialize").<sup>12</sup>
- **Telematics will collect mobile data beyond cars.** More than 1 million cars today already provide users with enhanced safety, navigation, and entertainment services using telematics (see the November 2000 Forrester Report "Cars Get Wired").<sup>13</sup> Companies like OnStar and Networkcar will start aggregating this data to create entirely new applications. For example, Infotrafic's traffic monitoring service will buy the aggregated, real-time feed from OnStar systems to provide up-to-the-minute traffic information -- all without adding a single traffic helicopter.

### Who Will Dominate The Extended Internet? It's A Free-For-All

Where the executable Internet was largely about software companies, the extended Internet will create more opportunities around hardware, data collection, and analysis. Forrester sees the extended Internet businesses getting started with:

- **Instrument builders like HP, Motorola, GARMIN, and NetBotz.** These innovators will create X-Internet smart devices that gather up real-world data like soil conditions, GPS locations, and data center temperatures. Firms will jump into these businesses when they realize that the volumes of devices they can sell will range easily into the billions.
- **Sensor-network owners like OnStar and Networkcar.** OnStar already has a million cars outfitted with its mobile phone and location sensor systems. NetworkCar is attaching devices to post-1996 US automobile engines through the emissions-control interface -- and using that data to collect maintenance information. Firms like these -- which deploy and operate sensors -- will be the Microsoft monopolies of the extended Internet. Why? Because their sensor deployments will create big barriers to entry for competitors -- and their revenue streams will grow with their always-increasing reach.
- **Data farmers like SAS Institute and Tilion.** These companies collect, sift, grade, and organize the data that comes from X Internet devices -- then sell it to other firms. SAS will sell its analytical tools to the sensor network operators in order to understand the real-world data gathered through the extended Internet. Tilion, which has its roots in the Web analytics business, will sell analytics as a service. All analytical companies will thrive by preventing companies from drowning in the data that the X Internet provides -- and help them understand what it means.

## ACTION

The evolution of the X Internet will usher in a new phase of technology change. The good news? Most firms already have their Internet connections. The bad news? These changes will require deeper knowledge of technology than the Web did.



### **Don't try to pick X Internet winners this early.**

Many companies are already jumping on technologies like Microsoft's .NET, assuming that an early decision will help them win in the X Internet. Don't -- it's too soon in the X Internet's evolution. Instead, invest your time and money in X Internet experiments that yield business value today. For example, you might want to add an XML interface to your customer data to ease partner data access today -- and prepare for executable apps to mine that data tomorrow.



### **Start looking beyond the Web.**

Most firms are still trying to satisfy customers with Web HTML and animated GIFs. But delighting customers in the executable Internet will require better user interfaces. Start using Scenario Design -- a methodology through which you identify your users, discover their goals, and observe how they can achieve those goals. Then prototype some executable code that makes those goals easier to reach.<sup>14</sup> You'll satisfy more customers and get a jump on the executable Internet.



### **Start using wireless networks.**

While wireless extended Internet systems will be cheap, wireless carrier fees won't be. To make internal extended Internet apps less expensive to deploy, start piggybacking 802.11b wireless Ethernet from companies like 3Com or Lucent onto your corporate network. Corporate road warriors can get started by using the wireless network now for email and intranet apps -- then, when you want to roll out an extended Internet app like production or supply chain monitoring, the network will already be in place.



### **Identify high-value extended opportunities.**

Look for places within the corporation where sensing the physical world in the business would decrease costs or increase revenue. For example, Michelin and Bridgestone have already started building smart tires with embedded processors that measure tire pressure, heat, and other factors. With early detection of excessive wear conditions, commercial operators can change out tires before they blow -- and the tire companies will sell more tires.

## WHAT IT MEANS

The Web's decline amid the rise of the executable Internet will throw firms off balance. Just when many CEOs have written off the Web as last year's news, early executable Internet apps will get attention as:



### **IT starts working on X intranets.**

The executable Internet will invade corporations the same way the Internet did: without IT's permission. Despite most companies mandating Web-only internal applications, some high-level executives will break their own rules and launch executable intranet functions. Why? Because once an enterprising VP discovers that he can model his 401(k) investments faster using an executable Internet app from Schwab, he'll see that the same technology can boost his division's productivity -- and he'll allocate budget for Altio's Designer tool to do that.



### **Corporate executable skills evolve toward open source.**

Java and XML are already two of the most in-demand skills for IT professionals in corporations.<sup>15</sup> But executable Internet applications will require similarly big investments in understanding user behavior and building graphical user interfaces (GUIs), something only firms like Microsoft, Apple, and Palm do today. Instead of rolling their own, firms will tap into the open source movement and grab code from sites like Eazel.com and OpenOffice.org -- and slash their development times in the process.

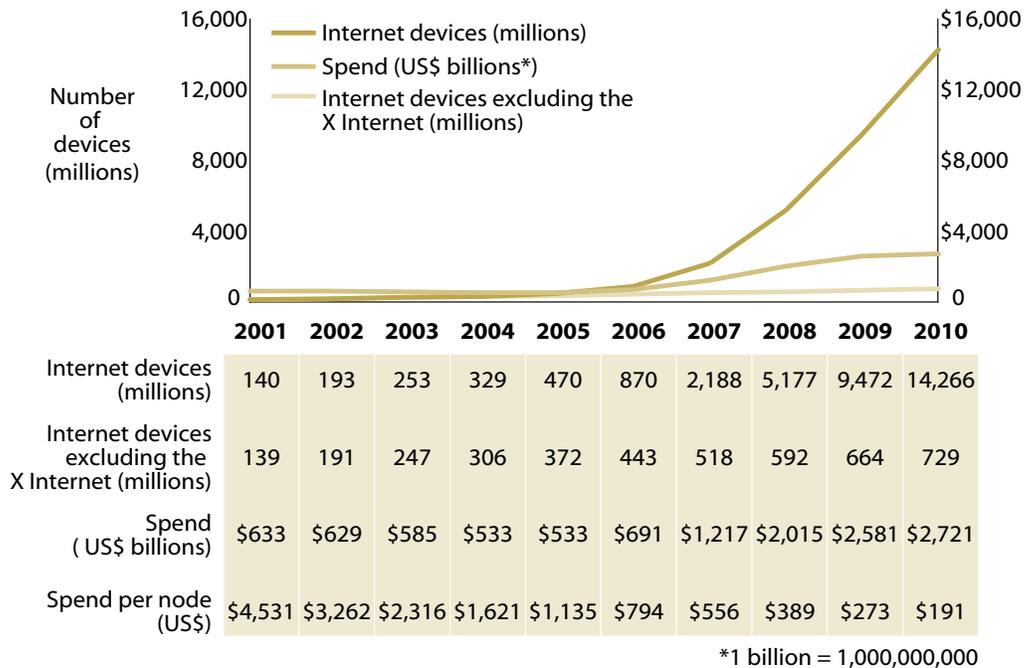


### **Microsoft's .Net promotes X Internet -- but delivers late.**

Bill Gates is selling corporations on intelligent Web services now, and Redmond already owns the minds and tools of developers. So why won't Microsoft dominate the executable Internet? Because the firm has so many products in the pipeline targeted at today's Web, it will be 2003 before it has complete solutions for the X Internet -- putting the firm two years behind startups like Altio, Droplet, and Fourbit that don't have that distraction.

But the executable Internet is still PC-centric -- and the world only has about 450 million PCs. The extended Internet will push applications to embedded chips and increase the Internet population by billions of nodes. The result? Today's Internet devices and services market of \$600 billion annually will grow to more than \$2.7 trillion worldwide by 2010 (see Figure 7). But in the process:

**Figure 7 Forecast: Worldwide Internet Devices And Spending, 2001 To 2010**



Source: Forrester Research, Inc.



**Cost per device will drop throughout the decade.**

Manufacturers, consumers, and service providers spend more than \$4,000 per year for each computer on the Internet today. But with the X Internet’s opportunistic connectivity and cheap devices, that number will drop to slightly less than \$200 per year in 2010. The X Internet market booms to 14 billion devices by 2010, but with the unrelenting cost pressure on every device and connection, the boom will feel like a never-ending price war.



**The X Internet will create an energy crisis for chips.**

With network interfaces embedded in everything from tires to clothing and billions of devices being deployed, power consumption will continue to soar. Chip makers like Intel and Motorola will get a new religion about power consumption -- and companies like IBM that have patents on low-power techniques like silicon-on-insulator will profit. Corporate users, on the other hand, will see power-saving programs like Energy Star make a comeback as governments try to stem ever-rising national energy use by Internet devices.

## RELATED MATERIAL

### Online Resource

The spreadsheet detailing the impact of the X Internet on the number of Internet-connected devices reported in Figure 7 is available online by clicking on the “Get Data” button above the figure.

### The Forecast Model For The X Internet

Forrester created a simple model to forecast the annual products and services revenue for the extended Internet. That model uses today’s Internet revenues from technology companies to create a “spend-per-device” metric. We then depreciate that metric over the next 10 years and combine it with our forecast of number of Internet devices to create the forecast model.

### Companies Interviewed For This Report

Altio  
*www.altio.com*

Consilient  
*www.consilient.com*

Dell Computer  
*www.dell.com*

Droplet  
*www.droplets.com*

Eazel  
*www.eazel.com*

EMC  
*www.emc.com*

Fourbit Group  
*www.fourbit.com*

GM/OnStar  
*www.onstar.com*

Hewlett-Packard  
*www.hp.com*

Intel  
*www.intel.com*

iVita  
*www.ivita.com*

LOBBY7  
*www.lobby7.com*

Medtronic  
*www.medtronic.com*

Microsoft  
*www.microsoft.com*

NetGratus  
*www.netgratus.com*

Nortel Networks  
*www.nortel.com*

Sun Microsystems  
*www.sun.com*

### Related Research

March 2001 Forrester Report “Net-Native Apps Emerge”

February 2001 Forrester Report “The Ubiquitous Internet”

January 2001 Forrester Report “P2P’s Pervasive Future”

December 2000 Forrester Report “Scenario Design”

## G R A P E V I N E

### **Cleaning up with today's extended Internet.**

Forrester recently discovered that MIT is way ahead of us in connecting the Internet to the real world. e-Vend.net, in which Maytag invests, has installed Internet-connected washing machines in one of MIT's dormitories. It's not as silly as one might think -- students can check on the Web for available washing machines, and when someone's laundry is done, the washing machine sends the student an email. Forrester knew that Internet appliances would catch on eventually, but who ever thought that soft wear would come from Downy instead of Microsoft?

.....

### **Converting Internet-connected machines into disconnected appliances.**

Have you ever wondered what to do with those extremely expensive but hopelessly obsolete servers in your data center? We came across a solution at <http://home.planet.nl/~mourits/koelkast/> that helps firms recycle Silicon Graphics Indy Challenge servers and turn them into -- refrigerators. Forrester thinks recycling like this is wonderful -- and nearly as elegant as turning swords into plowshares.

.....

### **Ring . . . "Do you want to play a game?"**

Online gamers have been the vanguard users of the executable Internet to date with games like WarBirds and EverQuest. But now video game giant Electronic Arts has started demonstrating a new game called Majestic, which incorporates some extended Internet concepts. While the game doesn't wire up players with sensors, it does intrude into real-world life by calling players on the telephone, sending them faxes, and interacting via instant messenger. Shades of the old movie "War Games" -- except the characters in this computer game, thankfully, don't play with thermonuclear weapons.

.....

### **Intel employs executable Internet tools to fight cancer.**

Intel recently held an event to enlist users' PCs to fight cancer using peer-to-peer software from United Devices. The goal of this first effort is to analyze 250 million chemical molecules for their cancer-fighting potentials. The science comes from the American Cancer Society, Oxford University, and the National Foundation for Cancer Research. Forrester thinks this project is a great use of executable Internet technologies. Just promise us that these executables won't put Blue Man Group ads touting Pentium 4s on our PCs.

## E N D N O T E S

- 1 This number is a Forrester extrapolation based on the Internet Software Consortium's January 2001 survey.
- 2 North America represents the bulk of this eCommerce boom today, but as Western Europe and Asia Pacific begin their eCommerce hypergrowth phases in 2001 and 2002, those two regions combined will exceed North America's trade amount by 2004.
- 3 Worldwide Net commerce -- both B2B and B2C -- will hit \$6.8 trillion in 2004. North America represents a majority of this trade, but its dominance will fade, as some Asian-Pacific and Western European countries hit hypergrowth over the next two years.
- 4 This data comes from a study commissioned by Cisco and done by the University of Texas Center for Research in Electronic Commerce and presented on January 12, 2001.
- 5 The Internet measurement data is from the Internet Software Consortium ([isc.org](http://isc.org)). The number of automobiles is from the report "Global Vehicle Remarketing" by Adesa Corporation; the number of mobile phones worldwide is from a article in *USA Today*; and the number of chips was extrapolated from Intel's count of 15 billion in 1999, published in "One Digital Day." While these numbers are not authoritative, they accurately represent the scale of the different categories.
- 6 Over the past two years, Forrester has evaluated the user experience on more than 100 B2B and B2C Web sites. Most failed. The shortcomings of these sites are because of both basic and advanced design flaws.
- 7 Forrester graded 30 B2B Web sites and found that every one failed basic tests of value, ease, and reliability. Major problems included missing content, meager function, and frequent errors.
- 8 Forrester commissioned Greenfield Online to conduct an online survey of 5,644 US consumers about their Web content buying habits and expectations. Results showed that consumers believed online content was lower quality and were mostly unwilling to pay for it -- and for the content they were willing to pay for, they wouldn't pay much.
- 9 This number is from the employment research firm Challenger, Gray & Christmas, as published in the February 28, 2001 *Upsidetoday* article, "Online retailers continue decline."
- 10 George F. Colony predicted the arrival of the X Internet in late 2000. The article is available online by clicking on "The Company" section of the Forrester Web site at [www.forrester.com](http://www.forrester.com).
- 11 The growing quantity and range of eMarketplaces creates a crowded, confusing environment. But as trade via these venues takes off, participants will come to better understand their needs, driving a shakeout over the next three years that will affect dot-coms and industry consortia resulting in highly specialized online US markets.
- 12 To enhance their performance, leading chemical firms will attack product development inefficiencies, turning to a new strategy: adaptive development. In this environment, suppliers will tailor solutions to individual customers by building interactive tools and plugging in outside specialists.
- 13 In 2000, Forrester estimated that 800,000 cars had safety and security telematics services installed; 200,000 cars had entertainment telematics services installed; and 400,000 cars had navigation telematics services installed.
- 14 Scenario Design focuses a company's technology, organization, and processes on helping its users achieve their goals, regardless of which channel they use. But before it can do that, it must identify the users, examine the goals those users have, and then observe how users achieve those goals online.
- 15 This information was obtained from a Foote Partners survey of 17,000 IT, a summary of which was published on April 10, 2001 in *eWeek* at <http://www.zdnet.com/eweek/stories/general/0,11011,2706525,00.html>.