

1. GoGo Gadgets

Now that wi-fi and other types of high-speed wireless networks are becoming common, devices using that technology are multiplying rapidly. Wireless gadgets run the gamut from cell phones to kitchen appliances and digital cameras. Here are some of the hottest new wireless broadband gadgets.

- Samsung's POPCON refrigerator features a wi-fi enabled, detachable screen that can function as a TV. The fridge can also be programmed to remember product expiration dates and generate alerts when the milk is getting old.
- The Nokia 770 Internet Tablet is small enough to fit in a pocket. It comes with a 10.5-cm-wide touch screen that can be used to access the Web over a wi-fi network. The device can also access the Web via a cell phone with a Bluetooth connection.
- Motorola's latest E815 mobile phone operates over Verizon Wireless's new EVDO (Evolution Data Optimized) wireless network, offering speeds comparable to digital subscriber line (DSL). The phone can even record and play back video clips. It also features a built-in MP3 digital music player.
- Hop-On's HOP 1515 may look like a typical cell phone, but it actually makes calls over wi-fi networks. Typically sold with a \$20 to \$30 monthly service plan, the phone allows for unlimited over-the-web international and long-distance calling. The HOP 1515 is sold through wi-fi hotspot operators, wireless carriers, and retailers.
- Eastman Kodak's EasyShare-One is a digital camera with wi-fi capabilities, allowing users to share their snapshots wirelessly. You will be able to snap a photo and immediately show it to a friend on a wi-fi-enabled PC or TV.

Project Focus

A dizzying array of new wireless technologies now promises to make today's wi-fi networks seem like poky dial-up connections by comparison. These new technologies will extend the reach of wireless networks, not just geographically but also into new uses in the home and office.

1. Research the Internet and discover new wireless devices that entrepreneurs and established companies can use to improve their business.
2. Explain how businesses can use these devices to create competitive advantages, streamline production, and improve productivity.

2. WAP

Wireless Internet access is quickly gaining popularity among people seeking high-speed Internet connections when they are away from their home or office. The signal from a typical wireless access point (WAP) only extends for about 90 metres in any direction, so the user must find a hotspot to be able to access the Internet while on the road. Sometimes hotspots are available for free or for a small fee.

You work for a sales company, SalesTek, which has a sales force of 25 representatives and customers concentrated in Calgary, Edmonton, Saskatoon, and Winnipeg. Your sales representatives are constantly on the road and they require 24x7 Internet access.

Project Focus

You have been asked to find hotspots so your colleagues to connect while they are on the road. It is critical that your sales force can access the Internet 24x7 to connect with customers, suppliers, and the corporate office. Create a document detailing how your mobile

workforce will be able to stay connected to the Internet while travelling. Here are a few tips to get you started:

1. Use Web sites such as www.wifinder.com and www.jiwire.com to determine which commercial hotspots would be the most appropriate for your sales force and the commercial network service that these hotspots use.
2. Research the Web sites of two or three appropriate commercial networks to discover more about pricing and services.
3. Use the Web to determine how many free public hotspots are available in these cities. Are there enough for your company to rely on or should you use a commercial wi-fi system? If so, which one?
4. You might also research www.fon.com to see alternative methods of using home broadband connections to stay connected.

3. Securing Your Home Wireless Network

These days, wireless networking products are so ubiquitous and inexpensive that anyone can easily build a wireless network with less than \$100 worth of equipment. However, wireless networks are exactly that—wireless; they do not stop at walls. In fact, wireless networks often carry signals more than 90 metres from the wireless router. Living in an apartment, dorm, condominium, or house means that you might have dozens of neighbors who can access your wireless network.

It is one thing to let a neighbour borrow a lawn mower, but it is another thing to allow him or her to access a home wireless network. There are several good reasons for not sharing a home wireless network. Doing so can:

- Slow down Internet performance.
- Allow others to view files on your computers and spread dangerous software such as viruses.
- Allow others to monitor the Web sites you visit, read your email and instant messages as they travel across the network, and copy your usernames and passwords.
- Allow others to send spam or perform illegal activities with your Internet connection.

Project Focus

Securing a home wireless network is invaluable and allows you to enable security features that can make it difficult for uninvited guests to connect through your wireless network. Create a document detailing all the features you can use to secure a home wireless network.

4. Weather Bots

Warren Jackson, an engineering graduate student at the University of Winnipeg, was not interested in the weather until he started investigating how the U.S. National Weather Service collected weather data. The weather service has collected most of its data using weather balloons that carry a device to measure items like pressure, wind, and humidity. When the balloon reaches a certain height and pressure causes it to pop, the device falls and lands a substantial distance from its launch point. The National Weather Service and researchers sometimes look for the \$200 device, but of the 80,000 sent up annually, they write off many as lost.

Convinced that there had to be a better way, Jackson began designing a GPS-equipped robot that launches a parachute after the balloon pops, and brings the device back down to Earth, landing it at a predetermined location set by the researchers. The idea is so inventive that the University of Winnipeg's Tech House—a university organization that encourages students to innovate and bring their ideas to market—awarded Jackson and some fellow graduate engineering students first prize in its third annual Invention Contest. Jackson won \$5,000, and access to expert advice on prototyping, legal matters, and branding.

Project Focus

GPS and GIS can be used in all sorts of devices, in many different industries, for multiple purposes. You want to compete, and win first prize, in the Invention Contest next year. Create a product, using a GPS or GIS, not currently in the market today that you will present at the fourth annual Invention Contest.

5. Wireless Networks and Streetlamps

Researchers in the United States at Harvard University and BBN Technologies have designed CitySense, a wireless network capable of reporting real-time sensor data across the entire city of Cambridge, Massachusetts. CitySense is unique because it solves a constraint on previous wireless networks—battery life. The network mounts each node on a municipal streetlamp, where it draws power from city electricity. Researchers plan to install 100 sensors on streetlamps throughout Cambridge, using a grant from the National Science Foundation. Each node will include an embedded PC running the Linux OS, an 802.11 wi-fi interface, and weather sensors.

One of the challenges in the design was how the network would allow remote nodes to communicate with the central server at Harvard and BBN. CitySense will do that by letting each node form a mesh with its neighbours, exchanging data through multiple-hop links. This strategy allows a node to download software or upload sensor data to a distant server hub using a small radio with only a 1-kilometre range.

Project Focus

You are responsible for deploying a CitySense network around your city. What goals would you have for the system besides monitoring urban weather and pollution? What other benefits could a CitySense network provide? How could local businesses and citizens benefit from the network? What legal and ethical concerns should you understand before deploying the network? What can you do to protect your network and your city from these issues?