

Bluetooth an emerging technology essay sample



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Blue-tooth is a great emerging technology being used today, which also has potential for much more uses than the tradition bluetooth headset. Bluetooth connects gadgets together, helping users listen to music, talk on phones without having to deal with frustrating cords and wires. To understand how a Bluetooth connection works, I will use an example such as a phone connected to wireless speaker. First, each device is equipped with Bluetooth connectivity, a feature that requires both software and hardware components. On the hardware side, an antenna-equipped chip in both devices sends and receives signals at a specific frequency. The software interprets incoming Bluetooth signals and sends them out in ways other devices can read and understand. In the case of the wireless speaker, the phone will know how to send audio files and information in a format that the speaker understands, while the speaker can interpret these signals—as well as other indicators such as volume and track controls—from the phone.

When two devices are equipped with Bluetooth, usually one of them will to be set to be discoverable, which means it will show up in a list of Bluetooth devices in the area on your controlling device. Using that example, the wireless speaker would be discoverable, and it will be able to be controlled by a Bluetooth-equipped device. The speaker/ Bluetooth capable device, sends out a signal with a little bit of information to alert other nearby devices of its presence and capabilities. The phone then connects, and the two devices form a personal area network, also known as piconet (A piconet is a network that is created using a wireless Bluetooth connection. A piconet consists of two or more devices occupying the same physical channel (synchronized to a common clock and hopping sequence). Now that

this process happened the two devices know to connect with each other based on the unique address within their respective signals. No matter what other signals come in on wavelengths in which those devices operate, they will always detect, read, and send the correct signals.

Bluetooth signals have a limited range, which prevents massive amounts of conflicting data covering huge areas and interrupting communication between other devices.

Bluetooth chips produce wavelengths that are bound to frequencies operating within a range specifically set aside for this sort of short-range communication. Other devices you might find that use this frequency include cordless telephones and baby monitors. However, there is an issue with always using the same frequency. Other devices operating at the same, or close, frequencies can cause interruptions in the signal. To prevent this from being an issue, the signal is spread out over a wider range of frequencies. In order to achieve this, the signal hops around the frequency, and in the case of Bluetooth that happens about 1600 times per second. The frequent change in wavelength means that even a consistent signal won't interrupt, and won't be interrupted, for longer than 1/1600th of a second. Bluetooth headsets can sync up in two different ways, using a full or part duplex connection. Or using a full-duplex signal means that all connected devices are able to send and receive signals meaning a two way conversation simultaneously occurring in this instance, as opposed to a half-duplex signal, like a walkie-talkie, where each side can still talk and listen, just not both at the same time.

Blue tooth does have its advantages and disadvantages, that can make or break its progress in today fast pase technological society advantages and disadvantages of Bluetooth technology are commonly known users who regularly use it absolutely swear by it, especially because the data transfer speeds that are provided are very impressive. Since multiple devices can communicate with each other easily, there are hardly any compatibility issues with using it, and this makes it an even more attractive prospect. IEEE standerdized it for use with a vast range of compatible devices. One of the single biggest advantage with thiis technology is the fact that there are absolutely no wires or cables required, but its only limitation is that it can not be used effectively over a maximum distance of 100 meters.

Its most common use is seen in conjunction with the mobile phone, all major smart-phones in circulation today are equipped with a Bluetooth connection, and this enables the devices to sync up with multiple devices in the vicinity and exchange data. This technology is also very popular in tablets, laptops, netbooks, Bluetooth headsets for mobile phones, printers, video game consoles, DVD players and TV remotes. There are a number of other areas where it is implemented as well and it is only a matter of time for the technology to really encapsulate our daily lives. Here are some more advantages/disadvantages:

Advantages of Bluetooth

Bluetooth does not require a clear line of sight between the synced devices. This means that the devices need not be facing each other, and it is also possible to carry out transfers when both the devices are in separate rooms. The fact that this technology requires no cables and wires is something that

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has made it so popular. With so many devices engulfing our lives today, the need for clutter-free technology is becoming more intense. One major advantage is its simplicity of use. Anyone can figure out how to set up a connection and sync two devices with ease. The technology is completely free to use and requires no charges to be paid to any service provider. The chances of other wireless networks interfering with yours are very low. This is because of the low powered wireless signals that the technology adopts, and also because of something known as frequency hopping. Bluetooth low energy technology is the key feature of the Bluetooth Core Specification 4.0 (Bluetooth v4.0) and has inherited several technical features from Classic Bluetooth technology that provide for robust, reliable connections.

New features allow for 'event-driven' data acquisition, proximity sensing and time synchronization. But in many ways, Bluetooth low energy technology is a very new wireless technology. Bluetooth v4.0 is fundamentally different in that it is designed for transmission of small amounts of data instead of periodic data streaming connections featured in Classic Bluetooth technology. For example, Classic Bluetooth provides support for headset and streaming audio data, a feature that is fundamentally absent from the Bluetooth low energy technology model. The technology features very efficient discovery and connection set-up, short packages and asymmetric design for small devices. Everything from physical design to use models is designed to keep the power consumption at a minimum. In order to reduce the power consumption, a Bluetooth low energy device is kept in sleep mode for most of the time. When an event occurs, the device wakes up and a short message is transferred to a gateway, PC or a smart phone. The

active power consumption is reduced to a tenth of the energy consumption of Classic Bluetooth technology. In low duty cycle applications, a button cell battery CR2032 could last for 5 - 10 years of operation.

In order to offer compatibility with Classic Bluetooth technology and cost efficiency for small battery-operated devices. Stand-alone Bluetooth low energy technology optimized for small battery-operated devices with low cost and low power consumption in focus. Bluetooth low energy technology uses the same Adaptive Frequency Hopping (AFH) technology as Classic Bluetooth technology in order to achieve a robust transmission in 'noisy' RF environments found in the home, industrial and medical applications. In order to minimize the cost and energy consumption, Bluetooth low energy technology has reduced the number of channels to 40 2MHz wide channels instead of the 79 1MHz wide channels in Classic Bluetooth technology.

Disadvantages of Bluetooth

Though the transfer speeds are impressive at around 1 Mbps, certain other technologies like Infrared can offer speeds up to 4 Mbps. This is an area that can be improved on in the near future. Even though the security is good, it is even better on Infrared. This is because of the comparatively larger range of Bluetooth and also the lack of a line of sight. Someone who knows how to hack such networks can do so eventually. Devices can retrieve radio-waves in the air thus making sensitive data being sent in any wireless networking setup, security is a concern. Devices can easily grab radio waves out of the air, so people who send sensitive information over a wireless connection need to take precautions to make sure those signals aren't intercepted.

Bluetooth technology is no different, it's wireless and therefore susceptible

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to spying and remote access, just like is susceptible if the network isn't secure. Other problems like "bluejacking," "bluebugging" and "Car Whisperer" have turned up as Bluetooth-specific security issues. Bluejacking involves Bluetooth users sending a business card (just a text message, really) to other Bluetooth users within a 10-meter (32-foot) radius.

If the user doesn't realize what the message is, he might allow the contact to be added to his address book, and the contact can send him messages that might be automatically opened because they're coming from a known contact. Bluebugging is more of a problem, because it allows hackers to remotely access a user's phone and use its features, including placing calls and sending text messages, and the user doesn't realize it's happening. The car whisperer is a piece of software that allows hackers to send audio to and receive audio from a Bluetooth-enabled car stereo. Like a computer security hole, these vulnerabilities are an inevitable result of technological innovation, and device manufacturers are releasing firmware upgrades that address new problems as they arise. The battery usage during a single transfer is negligible, but there are some people who leave the device switched on in their devices. This inevitably eats into the battery of these devices, and lowers the battery life considerably. Bluetooth and VoIP

There are several solutions to the VoIP/Skype limited mobility problem. One of the simplest and least expensive solutions seems to involve combining bluetooth wireless technology with VoIP. Bluetooth is an industrial specification for wireless personal area networks (PANs). Bluetooth provides a way to connect and exchange information between devices like personal digital assistants (PDAs), mobile phones, laptops, PCs, printers and, digital

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cameras via a secure, low-cost, globally available short range radio frequency. I would be safe to say that in the future entire offices will be perfectly efficient without cables. No mouse cable. No keyboard cable. No printer cable. And yes, in this case, no telephone headset cable to keep you chained to your computer. In order for Bluetooth and VoIP to work well, you must first need a bluetooth-enabled computer (with Skype/ VoIP application). If your laptop is not bluetooth capable you can use what is known as a dongle.

A dongle is a Bluetooth USB adapter. Just plug it into a USB port on your computer, install the drivers and suddenly you have a bluetooth-enabled computer. You may already be using a Bluetooth headset with a cell phone or perhaps a PDA. If so, not much about this section will be new to you. In addition to a Bluetooth headset, there's one other component that looks like the perfect application to round out this strategy. It's a software application called SkypeHeadset, created by a UK company. It goes for US \$20.00, and it seems well worth it just to simplify the process of pairing your headset to use with Skype. Here's the description from the SkypeHeadset site: Skype-headset is a software application that seamlessly connects a Bluetooth headset to Skype on your PC so that you can dial, pick-up, hang-up or mute calls with the headset buttons.

The software works with all popular Bluetooth headsets. " Skype-headset enables your PC to behave more like a mobile phone or a cordless telephone. You don't have to be sitting in front of the PC to use Skype - you can be up to 20 meters, away and using the headset buttons to manage your calls. If you are using a headset that connects with two or more devices, you can

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take incoming calls from your mobile phone or from Skype. Bluetooth Charging.

With over a decades' worth of perseverance, physicist Hatem Zeine might have found a way to recharge a mobile device completely wirelessly - without coming into any physical contact with a charging base. The Cota by Ossia is a breakthrough technology that can transmit wireless power for industrial usage, as well as consumer applications. After debuting the Cota wireless charging prototype and revealing his company Ossia for the first time at Disrupt, Zeine is confident that his wireless power technology will change the way power is transferred. Devices that are Cota-enabled can receive power within a 10 foot radius. The device employs the same frequencies used by Wifi and Bluetooth to send magnetic charges to designated devices or hotspots. Currently, this technology is already in the final stages of FCC approval. Ossia has hopes to incorporate Cota into consumer devices as early as 2015. Zeine foresees an end to our battery dependency within the next ten years. He imagines a world in which there's a Cota charger everywhere you look.

Mobile devices will be able to talk to wireless charging platforms through a partnership between the Alliance for Wireless Power and the backers of Bluetooth. A4WP is one of a handful of emerging standards for powering up devices without having to plug them in. It's expected to ship next year in charging pads for homes and public venues such as coffee shops. The Bluetooth SIG has issued a UUID (Universally Unique Identifier) to the A4WP for use in its BSS (baseline system specification). With the BSS, A4WP chargers will be able to communicate with smartphones and other devices

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via Bluetooth Smart, a low-power version of Bluetooth for so-called Internet of Things applications. Bluetooth Smart will be able to carry session management and power control data, the groups said. Wireless charging platforms by themselves just transmit electricity into devices through space or other objects. A4WP charging pads can stand by themselves or be installed in counter tops and other furniture. Users with handsets, tablets and other products equipped for A4WP can charge them just by placing them on top of the pad or somewhere else in the immediate area. Adding Bluetooth Smart to chargers will provide a communication channel that many mobile devices are already equipped to use.

Virtually all new smartphones and tablets sold in the past two years have chips that support Bluetooth Smart, and the technology is also coming into operating systems. All iPhones since the iPhone 4s, all iPads since the third generation of the tablet, and all Windows 8 and 8.1 systems have it, once a device can identify itself to a charging pad, there are many ways that information can be used, Jawanda said. The Bluetooth SIG envisions applications such as a way for consumers to put their phones down on a charger in a coffee shop and automatically have their regular order sent to the staff. There are also possibilities for mobile payments, including automatic payments for using the charger, and location-based services. Theoretically, Bluetooth could even transmit information about how much power a device has drawn from the charging pad, That would allow users in public venues such as airports to charge a device with one of the pads and pay just for the amount of energy they consumed, he said. The A4WP was

founded by well known mobile power houses Qualcomm and Samsung and also counts Intel among its members.

The memorandum with Bluetooth is not exclusive and A4WP is open to considering other technologies that will enhance the user experience, but it's building in Bluetooth from the beginning. Technology trends are moving toward a completely wireless and mobile world, and our device chargers have followed suit. Wireless charging, also known as inductive charging, is a convenient and fuss-free way to power up your smartphone. Wireless chargers emit an alternating current via a transmitter coil, which then induces a voltage in the receiver coil found in the device. Qi (pronounced "chee") wireless charging pads are capable of charging smartphones, tablets, Bluetooth® headsets, cameras and portable power packs.

Note: You do need one of these pads for wireless charging; a smartphone that says it has wireless charging capability will not charge itself. At least, not yet anyway. But wireless charging is simple: Just plug in the charging pad and place your device on it. In conclusion the benefits of the technology easily outweigh any negative aspects. Bluetooth is widely used by millions of people from all around the world, and it is sure to spread even further as time goes by. The ease of use and convenience that it offers is unmatched, and it is only a matter of time before every single gadget and electronic device in our home makes use of this technology. Bluetooth can be used in numerous ways, such as wireless charging, calling, playing music hands free. Bluetooth also does have its down side such as security, and range.

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