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Some of the best technology advancements are the ones that introduce fundamental new capabilities, and in most cases, these are not immediately met with thunderous applause. Many of us remember when Wi-Fi and 3G first emerged. The connections were slow and spotty at best, but it was a monumental leap in modern computing and communication that forever changed the paradigms of our society.

Still, connected devices today have one common problem: power consumption. Devices need a battery or wall outlet in order to function. Device manufacturers are seeking alternative methods to generate power for chips and computationally intensive features, all while keeping devices compact, functional and aesthetically pleasing. But if a device needs to do something smart, it needs enough power to feed that action. And if we want devices to be smart anywhere, anytime, then we need to start feeding them with wireless power.

The Truly Wireless Power Revolution

Soon, it will be commonplace that all mobile and a majority of your household and office devices will be powered completely without wires. The power cable will fade into obsolescence, just as the ethernet cable did years ago. Not because it's less efficient than its wireless counterpart but because of convenience and the insatiable desire to have access to our devices anywhere, anytime.

You're likely familiar with magnetic induction ("Qi") charging pads. Companies like Samsung and Apple are pushing the technology forward by developing standalone Qi charging pads and pushing for embedded charging technology in new devices. With Qi chargers, charging is limited to the specific location of the pad and the device cannot be mobile while topping off -- meaning the solution is not truly wireless. Regardless, Qi charging is an important stepping stone to the next level of innovation: long-range wireless charging.

Long-Range Power Technologies

With long-range wireless power, devices that are equipped with a receiver can be powered by a transmitter from across the room. There are a handful of technologies aiming to take wireless power into mass adoption.

For example, radio frequency (RF) power is a technology that is used by companies such as Energous and Powercast to achieve long-range wireless power. RF transmitters send energy via radio waves to devices containing complementary receivers. The receivers convert those waves into DC power, which then charges a battery. This is useful for extreme low-power use cases, because when RF is transmitted beyond one meter, it begins to disintegrate, limiting the amount of energy that can be captured at the device level. If RF's power level is increased to compensate for this drop-off, there is a serious risk of exceeding the safety standards for radio. RF is man-made radiation and living organisms have not learned to adapt to it yet. Additionally, RF can interfere with the communication of other devices.

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Art of the Possible: The Next "Wireless" Revolution in the Enterprise

Ultrasound is another long-range power approach developed by uBeam. An ultrasound transmitter emits high-frequency, inaudible sound that a microphone-like receiver picks up and converts into usable electrical energy. The limitations of this approach are that the beam can disintegrate and it has very low efficiency.

Another approach, and it's one that we at Wi-Charge are employing, that is looking to make long-range wireless power a reality is infrared (IR) light. When harnessed for power transmission, IR light, which accounts for roughly 50% of sunlight and has always been part of Earth's ecosystem, can safely transfer a few watts to a device up to 16 feet away. This is enough power to charge phones and internet of things (IoT) devices. Infrared waves are light (just not visible to the human eye), so a line of sight between transmitter and receiver is required.

However, a line of sight doesn't need to be available all the time -- just enough time to allow charging.

How Wireless Power Could Change The Enterprise

Long-range wireless power can bridge the gap between flexibility and performance in connected devices. Here are some real-world examples of how this technology could benefit major business sectors:

- **Retail/Hospitality:** Wireless power in cafés, restaurants and airports could allow customers to use and easily power all their connected devices, as well as the venue's devices, such as point-of-sale terminals and tablets. Wireless power eliminates the need to be stationary to charge, allowing customers to be free to explore their environment and business owners to deploy untethered pay stations virtually anywhere there is high foot traffic.



- **Health Care:** Hospitals, clinics, and doctors' offices could use wireless power to help improve patient experiences and reduce operating costs. Many health care devices are mobile, like EKG and IV machines, but require expensive batteries or a web of wires connected to an outlet. With wireless power, batteries would no longer need to be replaced or serviced and stationary machines would become mobile, giving patients and doctors more recovery and treatment area options.
- **Industrial and Manufacturing:** Wireless sensors and IoT machines utilized in factories and assembly lines are ideal applications for wireless power. As advanced robotics become more prevalent in manufacturing and warehousing settings, wireless power could help reduce operating costs even further, increase efficiencies, and limit slowdowns and downtime.

Soon, I believe wireless power will be as readily available and distributed as Wi-Fi. Devices of the future will become more compact as brands re-engineer products to eliminate large battery compartments and restrictive cords, giving them more utility and a new, sleek aesthetic.

Like every launch of new transformational technology, we can only imagine where it starts. Revolutions are like icebergs: You only see the tip before understanding how massive they really are. The wireless power revolution is upon us and, while the potential impact of wireless power is immense, I firmly believe the best is yet to come.

WI-CHARGE
TO POWER WITH LIGHT

