

# Terms: Innovation, adoption, diffusion, etc.

Going with a fairly standard dictionary definition, an **innovation** is *any new technique, tool, method, etc.* I don't find this to be particularly useful – it's too broad!!

So here's what I like to do (borrowing from a very shaky understanding of epistemology): First, let's characterize an innovation as *new knowledge*. (Yes, this is not at all getting narrower than the previous definition, but bear with me.) Next, let's split knowledge into two categories: knowledge of "what is" vs. knowledge of "how to do." Examples: I know that peanut butter and jelly sandwiches are delicious in direct proportion to the amount of jelly (knowledge of "what is"); I know how to make a peanut butter and jelly sandwich so that I don't overload the jelly and end up with a mess (knowledge of "how to do"). If you're a fan of Greek philosophy, this is a little like the difference between *episteme* (knowledge, or "belief that something is true") and *techné* (craft, or knowledge of how to do something).

When you match these two of knowledge up against innovations, it's pretty clear that most innovations (that is, new knowledge) fall into the "how to do" section: riding a horse or camel is a new way to transport oneself; a bicycle is again a new way to transport oneself; an internal combustion-powered vehicle is a further innovation; an electric car is yet. However, innovations can also be new concepts or ideas (the "what is" section): Copernicus' heliocentric model of the solar system was an innovative understanding of what is; Darwin's understanding of evolution (natural selection for successful traits, random variation over reproductive cycles introducing new/different traits, verrrrrry long time span) was a controversial understanding of what is. (It still remains controversial to some people today, for a variety of reasons that continue to astound me.)

An **adoption** is when an individual switches from one "how to do" or "what is" to a different one. When I switched from Hotmail to Gmail, I adopted Gmail. (I think that happened with pretty much the entire Hotmail user base.) If I buy a Prius to replace a 1974 Jaguar E type convertible, then I have adopted a hybrid vehicle instead of a 12-cylinder gas guzzler. (If anyone reading this has a 1974 Jaguar E type convertible, I would like to be your friend and ride around in it. Not sure I'd want the headaches of owning one, but goodness are they beautiful.)

Note that not all adoptions are necessarily replacing something 'bad' with something 'good'. (This assumption is called "the fallacy of progress.") When field-cropping replaces block planting (e.g., the [Three Sisters](#) system of Native North Americans), it's a mix of good (more production per acre, more rapid harvesting) and bad (soil depletion, escalating use of fertilizers and/or pesticides, possible reduced dietary variety). The two systems are different, but whether one is better and the other worse is more complex and often rests upon a set of value judgments.

Adoption decisions often involve different levels of technology, such as hand washing your dishes vs. using a dishwasher. Typically, the adoption decision involves switching to the higher technology version, but this is not always true--you may decide to switch from the high-tech fancy coffee machine to a lower-tech process such as using a funnel or cold-brewing coffee...it just depends on your needs.

When we look at all adoption decisions across a population, we're talking about **diffusion**. Consider telephones: They were once relatively rare devices, and people weren't quite sure what to do with them. (The [Wikipedia article on the history of the telephone](#) is fascinating and doesn't even cover the full weirdness involved. For example, it fails to mention the [1878 Tariffville, CT](#) train wreck that helped set in place the pattern of use we have today. It also doesn't address the concept of the [telephone newspaper](#), which blows my mind every time I think about it.) The way we experience and use telephones today is the result of not just innovation, not just individuals' adoptions, but the larger patterns of diffusion through the industry (manufacturing, servicing, networking, retailing) and the consumer base (us).

For a contemporary example of diffusion, consider the compact fluorescent bulb (CFL) and LED bulbs, as they slowly replace incandescent light bulbs. The early CFLs gave off a pretty horrible light, but once they've improved (an innovation), they become much more attractive targets for adoption. CFLs are steadily diffusing, part due to manufacturers (Wal-Mart decided to produce and sell them, meaning that they're broadly available at a criminally low price) and in part due to policymakers (the Bush administration developed light bulb efficiency standards, the Obama administration started enforcing them...and then Congress stopped that, saying that the incandescent bulbs would have to be pried out of their cold, dead fingers). With enough nudges, though, CFLs are now widely diffused; LED bulbs are following (to my knowledge) a slower course. although I think they're at or close to a tipping point.

Rogers studied the adoption and diffusion processes and was one of the first to construct theories of these process; we'll look at his [findings](#) next.