

off big enough to make up for all the failures. The cleverness of an invention or the existence of a patent is a poor gauge of innovation.

Although invention and innovation are not the same, they have common aspects (see Figure 1). Both inventors and innovations start with a possibility. The inventor turns the possibility into an idea, artifact, patent, or process and proposes that others consider it. The innovator turns the possibility into an offer for adoption and then follows it through to adoption. In fact, as we will see shortly, the practice of invention is the first three of the seven practices of innovation. Many innovators bypass the work of invention by taking up what inventors have already proposed.

These distinctions have been lost in common thinking. To many, innovation means “a novel invention.” An unfortunate consequence of this muddle is that many people believe that the skill of innovation

more common than larger—typically, doubling the size yields one-fourth as many innovations. A beginner at innovation typically produces small ones, an expert much larger ones.

**Speed.** Innovation takes time. Some people adopt faster than others. Rogers divided adopting populations into five groups: inventors, early adopters, early majority, late majority, and laggards. The overall speed of adoption depends on the relative advantage perceived by adopters and the severity of barriers. People adopt for all sorts of reasons besides economic advantage—for example, self-esteem, lifestyle, survival, longevity, or professional reputation.

**Radicalness.** Most innovations are incremental. The radical innovations—they change our interpretation of the world—are atypical and unusual. The ATM changed banking practice but did not change how people saw themselves as human beings. The

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can be cultivated by teaching the mental skills of invention such as puzzle solving, conceptual block-busting, or creative thinking. They are invariably disappointed when they find these skills do not produce adoption of their inventions.

#### THE MANY FORMS OF INNOVATION

The inspiring stories of great innovators can mislead us into thinking that innovation is always unusual, good, big, fast, or radical. However, this is not so:

**Usualness.** Innovation is a normal human process—almost everyone is looking for better ways to do everyday things. There is nothing unusual about it. The bulk of innovation in the developed world comes from small businesses with limited clientele. Celebrity innovators are responsible only for a tiny fraction.

**Goodness.** Innovation can have negative consequences. A bad innovation can be abandoned because a post-adoption evaluation concluded it was unsustainable.

**Size.** The size of an innovation is the number of people who adopt. Innovations come in all sizes. A workgroup of 4 can adopt a new email practice, a city of 40,000 a new traffic pattern, a nation of 4,000,000 a new Internet culture. Smaller innovations are much

computer is said to be radical because, through its instant worldwide communications, it is changing us from locally aware beings to globally aware beings.

#### TOWARD A GENERATIVE FRAMEWORK

One of the ways we understand a practice or skill is through a framework that offers a high-level view of how it works. The vast literature on innovation offers three main frameworks: theoretical, empirical, and generative [10]. Theoretical frameworks, such as Drucker's principles of innovation [3] or Klein and Rosenberg's chain-linked process model [5], and empirical frameworks such as Rogers's diffusion model [7], are good for revealing the overall structure of innovation process and the areas most deserving of the innovator's attention. But they are not good for telling the innovator what skills to build, how to practice them, or how to deal with breakdowns that will be encountered in the process.

In contrast, a generative framework tells the innovator exactly what actions are needed to cause innovation and specifies them in a way they can be learned and executed. These actions are the focus of practice for improving one's skill at innovation. Generative frameworks have been used in other areas. For exam-