

Patents and Technology Evolution: Altering Innovations and Innovators via Patent Influences

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Technologies improve primarily through evolutionary change not rational optimization. New technologies emerge as attempts to solve practical problems, the technologies are tested in marketplaces to determine if they are superior in cost and function to alternatives, and those that fare well in the testing gain widespread adoption. Widely adopted technologies, and their problems, form the basis for the next round of technology improvements and evolution. Through these steps, evolutionary processes lacking rational direction can generate changing technologies matched to the desires and problems of present society.

As they operate to advance diverse technologies, evolutionary processes governing technology change are subject to important influences from patent rights and incentives. Patent interests affect how new inventions that are outliers departing materially from prevailing knowledge in their technical fields are generated, tested, and propagated. Patent rewards also increase the strength of innovators who are successful in producing outlier advances, enhancing the chances that these parties can generate more outlier inventions. By biasing technology change processes towards more outlier inventions, more marketplace testing of those inventions, and greater strength of innovators capable of creating outlier inventions, the patent system enhances technology change through evolution in several respects and broadens the range of useful advances made available to the public. This article describes these important patent influences on technology evolution. It also includes a normative discussion of changes in patent laws that will increase the impacts of patents on outlier innovations and the diversity of useful advances made available to the public.