abstract: Patent data has been a popular resource for research and analysis on technological innovation. So far the most used patent statistics used for innovation evaluation have been primarily counts, such as the number of patents. However, simple quantities are insufficient to represent the quality of inventions or their level of novelty. We follow Schumpeter's notion of "Creative Destruction" and propose a measurement of innovative destructiveness. Using a network approach to patent data, we construct the Cluster Destructiveness Index and Patent Destructiveness Index to measure network-level and patent-level technological destructiveness based on the degree of technology cohorts recombination over time. Through examination of the relationships between destructiveness indices and the numbers of patent applications and backward citations, we describe a conjecture of technological evolution cycles consisting of the exploration stage and the intensification stage. With an application to artificial intelligence patents in the United States and Japan, we verify the proposed indices with other patent indicators and industry milestones. We also measure destructiveness at patent applicant level and find association with the applicants' operation scale, business type and R&D strategies. The contribution of this work is twofold: a network analysis method for patent data analysis, and an additional perspective to help reveal dynamics in technology evolution and entrepreneurship.