

# MISQ Archivist

## Supply-Side Network Effects and the Development of Information Technology Standards

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### Abstract

Standards are central to many information technology (IT) applications, and the development processes for these standards play a key role in the evolution of information systems (IS). We model the development of IT standards by technology suppliers as a coevolutionary technological search process under supply-side network effects, and we examine how the characteristics of the standards development process influence its outcomes. In line with common intuition and prior research, we find that perfect coordination among suppliers generally facilitates convergence on the best available standard. However, for complex IT standards, we make a novel contribution and find that this “best available” standard may be inferior to alternative, undiscovered solutions because coordination may lead to an overly narrow search. Consistent with prior research, we also find that either highly influential organizations or highly influential alliances and consortia can coordinate standard selection in order to prevent network effects from generating lock-in to an inferior option and to help set the best of the known alternatives as the standard. However, in contrast to the previous literature, we find that when coordination is imperfect and controlled by a moderately influential organization or consortium, it may lead to a technological lock-in dynamic in which suppliers adhere to an inferior solution and are subsequently unable to reverse this commitment, even when a technologically superior alternative emerges later in the search process. Further, we reveal the following paradox involving intellectual property rights (IPR) and related imitation costs: Although imitation costs can lead to the emergence of multiple standards, thereby reducing social welfare in the short term, this effect may have long-term benefits by broadening the search for future generations of a standard.

**Keywords:** Network effects, technological search, lock-in, simulation, standards