

Chapter VIII

Scope and Timing of Deployment: Moderators of Organizational Adoption of the Linux Server Platform

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ABSTRACT

Here we present a qualitative study of how organizations do (or do not) adopt a new computer server platform standard; namely, Linux using PC-compatible hardware. While discussions of Linux typically focus on its open source origins, our respondents were interested primarily in low price. Despite this relative advantage in price, incumbent standards enjoyed other advantages identified by prior theory; namely, network effects and switching costs. We show when, how, and why such incumbent advantages are overcome by a new standard. We find that Linux adoption within organizations began for uses with a comparatively limited scope of deployment, thus minimizing network effect and switching costs disadvantages. We identify four attributes of information systems that potentially limit the scope of deployment: few links of the system to organizational processes, special-purpose computer systems, new uses, and replacement of obsolete systems. We also identify an organizational level variable—internal standardization—which increases scope of deployment and, thus, the attractiveness of the incumbent standard.

INTRODUCTION

Economic theories have suggested how individual consumers make decisions between two or more *de facto* product compatibility standards. Positive network effects, mediated by the supply of third-party complements, make the more popular standard more attractive to potential adopters (Katz & Shapiro, 1985). However, in many cases, adopters choose standards (or their associated products) for much simpler reasons: they have a relative advantage on some dimension of price, performance, or features (Liebowitz & Margolis, 1994).

The research on network effects generally examines choices between contemporaneous standards rather than successive generations (see Sheremata, 2004, for a rare exception). However, potential users often consider adoption of a new standard in light of an investment in a prior standard, with switching costs discouraging adoption of a new standard (Klemperer, 1987; Greenstein, 1993). Given the advantages that incumbent standards generally hold in network effects and prospective switching costs, a new standard must enjoy some relative advantage on another dimension in order to attract new adopters. For example, successive generations of videogame consoles displaced investments in earlier consoles and software libraries by offering superior graphics and realism of play (Gallagher & Park, 2002).

Within this accepted theory, there are some gaps in our knowledge. *De facto* competition models tend to cover aggregate decisions of rational individual adopters and do not suggest which adopters will be the first to adopt. Based on an empirical study of organizational information technology (IT) standards, we suggest that there are at least three ways in which organizational standards adoption differ from consumer ones. First, such organizational standards decisions involve multiple decision makers and perspectives.

Also, a large organization typically will employ multiple standards simultaneously. Finally, there are important differences in the attractiveness of a new standard between systems within a single organization.

In order to try to explain such differences both between and within organizations, we focus on two research questions:

- How do organizations adopt new standards?
- How can a new standard can get adopted despite the network effects and switching costs that favor a successful incumbent technology?

As an example of an organizational standards decision in which a new standard recently has gained broad acceptance in the face of established incumbent technologies, we consider the selection of server platform standards. Using a qualitative study of management information systems (MIS) departments in 14 organizations, we look at the choice between three major server platforms: Windows, proprietary Unix, and Linux-based systems. Using inductive theory generation, we generate a set of propositions about factors that directly or indirectly influence organizational IT standards adoption.

We identify a new construct—scope of deployment—that considers the degree to which the adoption decision is coupled to other internal and external factors, including the organization's IT architecture, business processes, and supply of third-party complements. We show how the scope of deployment moderates the impact of external network effects and internal switching costs, in that new standards are most likely to be adopted for uses with a limited scope of deployment. We also suggest that the goals of internal technology standardization directly conflict with the opportunities offered by trial adoption of new standards.

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