Chapter XIX
Reducing Transaction Costs with GLW Infrastructure

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ABSTRACT

This chapter introduces the hybrid GLW information infrastructure as an alternative to proprietary-only information infrastructures with lower costs. The author argues that the use of FLOSS servers in a client-server infrastructure reduces the transaction costs relative to the data processing and the contract management that organizations have to support, preserving the investment already made with the installed base of clients in comparison to the use of proprietary managed servers. Transaction costs of two real-world proprietary infrastructures, Netware 5.0 and Windows NT 4.0, and of GLW, all with Windows 98 clients, are described and compared to give elements for the reader to analyze and decide.

INTRODUCTION

Firms, or more generally, organizations, develop and become larger over time, using more and more computers. Information systems of an organization turn into an information infrastructure, and the growth of the number of computers leads to a growth of software use (operating systems and their applications, e.g.), resulting in the growth of the number of software use and access licenses.

When all of the software used by the organization is proprietary, this growth leads to a greater supervision of users to regulate lawful access to software for the owners of software intellectual property rights since these rights are regulated by contracts, in this case, license agreements. This results in some costs associated with contracting—transaction costs—that are not usually taken into account by administrators and managers. They are used to paying much more attention to the costs of software licenses. However, what happens if FLOSS[1] is used?

This chapter aims to show a hybrid[2] information infrastructure named GLW[3] as a lower cost alternative to proprietary information infrastructures. GLW reduces the transaction costs of the organization in two ways: (a) by eliminating the access control mechanisms that are embedded in proprietary software, which reduces transaction costs in terms of computational costs, and (b) by reducing the number of managed contracts by half in comparison with some other proprietary information infrastructures.

BACKGROUND

What is an Information Infrastructure?

Once upon a time, computers existed as standalone devices. There was no (or very little) communication between computers within an organization. All work was truly local, based on local needs and standards. As organizations grew, personnel and computers multiplied. Methodologies were developed to all individuals within organizations to communicate to reduce the duplication of data and work, including models such as structured systems analysis (Gane & Sarson, 1983), modern structured analysis (Yourdan, 1990), structured systems design (Page-Jones, 1988), and, most recently, RUP (rational unified process) and UML (unified modeling language; Booch, Rumbaugh, & Jacobson, 1999).

All these methodologies (and many others) have been used for at least 20 years to model work and data to a certain size, time, and place. In the words of Hanseth (2002), "in short: IS methodologies aim at developing a closed system by a closed project organization for a closed customer organization within a closed time frame."

Planning information systems by scratching, designing, specifying, implementing, and "big-banging" becomes harder because it is not possible to change the installed base of hardware and software immediately. The solutions are (a) to improve the installed base by adding new functionalities, or (b) to extend the installed base by adding new elements to it (Hanseth, 2002).

An information system evolves into an information infrastructure, which is defined as "a shared, evolving, open, standardized, and heterogeneous installed base" (Hanseth, 2002). Its extension or improvement depends strongly on the existing information infrastructure, that is, the installed base. One can notice that the working definitions of information infrastructure and installed base depend on each other. Hanseth does not ignore information systems; they are treated in another way: as local phenomena.

Hanseth (2002) splits information infrastructures into two levels: application infrastructures and support infrastructures, with the first at the top of the second. The support infrastructure is split into two categories: transport and service infrastructures. These levels are depicted in Figure 1.

For example, Web browsers are part of the application infrastructure, TCP/IP (transmission-control protocol/Internet protocol) is part of the transport infrastructure, and DNS[4] is part of the service infrastructure.

Gateways are elements that "link different infrastructures which provide the same kind of service based on different protocols/standards. The infrastructures that are linked this way are called neighboring infrastructures" (Hanseth, 2002) and are used to escape from certain situations where an organization is locked into a certain software or hardware platform (Shapiro & Varian, 1999). This situation is depicted in Figure 2. One example of a gateway is Samba, software that connects Microsoft Windows and GNU/Linux infrastructures. This will be discussed later in the chapter.

This chapter will focus on infrastructures with up to 250[5] users and in which the installed base depends strongly on proprietary software, contracts, license agreements, and associated costs.

Modes of Interaction in Infrastructures

We can describe two main models of computational interaction found in computer science literature: peer to peer (collaborative, with de-