

8-15-1997

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Recommended Citation

Ginsburg, Mark, "Interoperability and Enterprise-Wide Information Infrastructure" (1997). *AMCIS 1997 Proceedings*. 176.
<http://aisel.aisnet.org/amcis1997/176>

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Interoperability and Enterprise-Wide Information Infrastructure

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In the increasingly network-centric decade of the 1990s, many firms with a global reach are planning and deploying firm-wide applications on top of their network infrastructure; groupware systems are a good example.

Planning at this level must take into account four major types of costs. Three of these are ex ante implementation: decision costs to gather the intelligence necessary to make an informed decision ex ante, evaluation costs, where vendor and internal products are compared, and coordination costs, another ex ante cost where multiple sources of information are integrated and vendor products are evaluated. The fourth cost type is ex post implementation: conversion costs accrue in order to meld incompatible formats and protocols.

Some firms choose to leverage open toolkits which make use of recent advances in distributed hypermedia publishing (the World-Wide Web, or WWW) to implement these systems; others prefer instead to rely on vendor offerings such as Lotus Notes. Still others opt for a hybrid strategy, implementing both vendor-based and intranet-based groupware systems. The more components in an IT infrastructure, the greater the conversion costs are likely to be. As Farrell and Saloner point out, when a converter is supplied by a single firm, that firm has the incentive to make conversion costly.

Although the general goal of firm-wide groupware is clear; a collaborative strata which spans most of all business units, there has been little or no research on the planning, architecture, or deployment of such systems although they carry great potential gain and risk.

By conceptualizing the underlying feature sets of this class of IT, and drawing a strong parallel to the shared Internet information space (in particular, the voluntary consensus standards bodies), this research will derive a set of principles to evaluate these alternatives pre- and post-deployment.

The gatekeeper role is cross-functional in the organization; in Allen's original conception the gatekeeper gathered data on murky shared spaces, such as University research projects and US Government sponsored grant projects. Now, since the Internet standards bodies exhibit rapid velocity and the willingness to share information fully to the public, the gatekeeper's role grows in importance. The information thus collected can be disseminated to various parties inside the firm responsible for large scale IT decisions. The gatekeeper, in the abstract, is helpful to the organization and it will be argued that the voluntary consensus bodies, with their reference standards, act in synergy with the gatekeeper role.

Thus, the consensus standards reduce the coordination costs, since they replace, to some degree, internal corporate R&D laboratories. They also lower evaluation costs, since the voluntary consensus bodies such as the Internet Engineering Task Force (IETF) and the World Wide Web Consortium (W3C) publish reference implementations to speed the development of working systems.

In three case studies, the research question of modeling optimal decision structures for investment in firm-wide IT will be studied. A model will be developed to account for infrastructure components from a decision perspective; thus the decision to purchase modular open standards subsystems versus the decision to purchase a proprietary vendor system can be modeled as well.

The concept of layers will be used to abstract the decision viewpoint. We have the application layer, the middleware layer, and the communication layer. All of these layers have reference standards stemming from the Internet standards bodies. This work will articulate a decision model for the buyer, demonstrate

the tradeoffs of a vendor solution versus a pure open standards solution, and discuss hybrid solutions where both paths are partially followed (a type of separated equilibrium).

The results of this work can be extended to suggest IT planning and deployment strategies for systems of varying scope (for example, a smaller system at the business unit level or a larger one at the inter-organizational level).

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