Deployment strategies for new software technology

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ABSTRACT

Strategy selection for the deployment of software technology is a key part of putting software to work within organizations. Several different deployment strategies are examined in this paper—diffusion, test site, and edict. Also some of the key elements in strategy selection are reviewed. Finally, three agents of strategy implementation are discussed—technology managers, information flow, and application centers.
INTRODUCTION

The deployment of software is an integral part of the software life-cycle. In any organization, a strategy must be adopted for deploying that technology. In this paper, several different types of strategies are examined.

Generally, any type of software technology that is significantly different from those an organization currently uses should be considered as new software technology. Typical examples are: significant new languages (e.g., Ada or OPS5), new technology areas (e.g., artificial intelligence or distributed computing), new software development methodologies (e.g., higher order software, object oriented design, or rapid prototyping).

Where the software technology is going to be used will affect the deployment strategy. Although one could examine the types of strategies that would be used if the technology would be deployed to customer organizations, this paper discusses deployment of new software technology within a parent organization. Three strategies are examined, ways to determine which strategy to use are presented, and general deployment tools are described.

STRATEGIES

Of the many different strategies that can be identified, three are discussed here: diffusion, test site, and the blanket or edict strategy.

**Diffusion**

The diffusion strategy is used to introduce a new software technology in non-selected areas and allow the technology to permeate the organization through word of mouth. This strategy forces the technology to sell itself and asks the users of the technology to become the salespeople. The diffusion strategy allows an organization to accept the technology on its own time-scale and to make choices about local deployment. Diffusion of technology by area in large organizations can take a long time and can cause various levels of the deployment to be apparent in the organization for long periods of time.

This strategy frequently is used when a small group of individuals determines the need for some type of technology. The technology is then implemented and spread through the organization by word of mouth. As an example, the precursors to the electronic conferencing tool VAX Notes were deployed within Digital Equipment Corporation using this strategy.

**Test Site**

The test site strategy is used to select a test location or test group to pilot a technology. Using this method, an experiment is run to see if the new technology is truly applicable within an organization. This strategy forces technology managers to decide on a test location and to enlist a test group as active participants. Test sites can later become showcases of the technology. By enforcing formal review procedures, valuable insights can be gained into the usefulness and problem areas of given technology. The test site strategy also consumes time and sometimes the results can be inconclusive.

As an example, Digital Equipment Corporation has formalized this deployment strategy through the field test methodology. Field test sites are carefully chosen and monitored to determine the effectiveness of the new technology. All Digital products must pass through this phase.

**Edict**

The edict strategy involves selecting a technology and then enforcing use of that technology across an organization. With this method, either a ramped or start date implementation plan is chosen and the technology is spread through the organization. This strategy forces the technology managers to make an excellent guess on the needs of the organization for this technology and to develop a "well oiled" implementation strategy. This strategy removes the problems that result when dissimilar technologies coexist.

This strategy can also be used "negatively." For example, the retirement of a particular product and subsequent discontinuation of its support is a form of the edict strategy. Digital uses a product life cycle methodology that contains a retirement phase for a given product.

STRATEGY SELECTION

Selection of a deployment strategy depends on a number of factors, some of which are discussed here. One element in strategy selection is how well original requirements are filled by the software technology selected. Another aspect is how the software was selected; that is, was it internally developed, externally developed, or purchased. The effect on the organization and the problem to which the technology will be applied must be examined.

Technology impact information can be gathered in a number of ways. One way is to survey targeted users of the technology. When designing such a survey, it is important to ensure that useful results will be obtained and that a majority of
users are questioned. Another way to gather information about how a new technology may affect a company is to form committees of technology managers and the target users. The composition of any committee should include the most vocal and most active members of the user community; however, typical members also should be included.

The goal of information gathering using these techniques is to reveal the attitudes of the users about a new technology and how they feel about the possible ways the new technology can be used to solve a problem. Frequently, users will feel that a problem does not really exist even if the problem has been identified by business or technology managers. Therefore, part of the deployment strategy will be to gain a consensus that a problem exists and is amenable to a new technology. Differing opinions about whether a problem exists typically result when a user community is large but only a small portion of the user community is included in technology selection. This problem can also occur when a change in business direction occurs and a new technology is needed to meet a business goal. For example, when companies with differing technology products merge, discrepancies in problem identification are likely to arise.

Once the receptiveness of the user population is determined a risk analysis should be performed to evaluate:

- Whether the correct technology has been chosen
- Time to deploy
- Return on investment for cost of deployment

The costs of deployment must include training, support, and distribution of user and reference manuals. The size of the user community will obviously affect this cost. Another aspect to study is if the organizational structure will change (or should change) with the deployment of the technology. Further, the complexity of the technology will affect training and support issues and may also affect the cost of the technology. For example, the complexity of the technology affects the length of training time and the amount of effort needed to complete the training. Also, the new technology could increase maintenance costs and payments to vendors and require additional computer equipment.

When the risk assessment is finished, the deployment strategy (or strategies) can be selected and a deployment plan developed. This plan should include the risk analysis, the deployment timetable, and a list of resources used to deploy the plan. A presentation can be developed and toured through the organization. This presentation should include the background to the problem for which the software technology is being deployed, the background to the technology, some of the options considered, the resources available and used within the organization during deployment, and the highlights of the deployment plan.

If the diffusion strategy is used to introduce a new technology, the deployment plan can become the formal recognition that a technology is in place and is meeting the solution to some problem within an organization.

Replication of effort and use of different strategies can increase the chances of success. Often a problem exists but either no reasonable technological solution exists or equally valid multiple solutions exist. In such cases different groups can develop and deploy different technologies and time will determine which will be the most successful.

OVERALL DEPLOYMENT TOOLS

The role of a technology manager is key within an organization. As an example of using technology managers, Digital has a team that consists of a staff manager and consultants. They are responsible to respond to both business management and the user community with effective choices of technology and deployment strategies for the technology. The technology management team is used for deploying different types of technology, including software technology. These players play the lead role in ensuring successful deployment of technology within the organization.

The benefits of having a technology manager are:

- Technology leadership
- Focus point for software technology issues and information
- Organization responsibility to respond to technology change issues
- Responsibility for long term technology plans

Another key deployment tool within an organization is information flow. Large amounts of current information must be moved within the organization. Adopting multiple lines of communication is necessary to service the needs of all members. Digital, for example, has several types of communication formats. Videotex databases are used for bulk delivery of current information on technologies. VAX Notes electronic conferencing is provided for both private and public discussions of technical and non-technical issues. Scheduled review meetings between users and technology managers are used to provide face to face communication.

Providing current information to the user community has many benefits. These include reduction in printed material, quick feedback on problems and questions, forums for timely discussions, and quick changes to rapidly changing information.

Finally, software needs hardware on which to execute. To provide focus points for software technology tools, technology information centers should be provided. For example, Digital has introduced Application Development Centers to provide common locations where software technology can be found. These centers are linked to facilities throughout the organization through Digital's internal computer communications network.

Technology information centers are beneficial when used as:

- Test sites for software technology introduction
- Catalogue and inventory sources of available software technologies
- Known software information interchange locations.
CONCLUSION

Successful introduction of software technology requires the selection of an appropriate deployment strategy. This strategy is embodied in a deployment plan that describes the risk analysis and deployment timetable. Finally, technology managers, good communication channels, and focused hardware resources are necessary to develop and implement effective deployment strategies.

REFERENCES
