Managing the Implementation of an Imaging System

Kenneth R. Rohr

***Abstract*—There are always risks inherent in changing from an old and established business process to a new one. Errors in analyzing the needs of the business, weaknesses in communicating those needs to vendors or lack of provision for future extensions can lead to a failure. All these risks can be managed by a strategy using incremental changes to the business process, creating an environment where someone has responsibility for both the implementation and the results, and adhering to industry standards.**

I. Introduction

THE introduction of new technology can dramatically change a commercial process. In the mid 1400's, movable type technology automated the process of printing. In the 1980's, advances in recombinant DNA research created a new means of insulin production. A costly extraction process was replaced with a highly automated process. These were major changes in technology that carried substantial risk for those companies that invested in them. But they transformed the way companies carried out their business. The companies that embraced the new technology thrived while their competitors vanished.

There are countless examples where new technology successfully improved productivity after incurring a risk. How can the risk inherent in change be managed?

When implementing an imaging system, there are three important risk factors that must be understood and minimized:

- Analysis error—In the planning phase of a new project, estimates may be incorrect or important details may be overlooked.
- Communication error—Specialization can isolate project members from each other. No one understands both the business needs and the technical issues.
- Obsolescence—A component of the system may be replaced quickly by a newer more cost effective technology.

Each of these risk factors can be managed. The following sections address each and present the methodology that we use to minimize possible exposure.

II. Incremental Change

Sometimes it seems that risk is minimized when an organization makes no changes to the way they carry out daily business. But factors such as inflation and growth of the organization predictably and safely drive up business costs each year. (See Figure 1.) This may not be risky, but nor is it desirable. Successful organizations constantly look for ways to reduce costs.

Technology is available to create an entirely paperless office. All text, numeric data and images can be digitized and displayed on large high resolution screens. All information can be transferred by networks. Work flow can be automatically controlled by large database applications. But implementing such a change for the entire enterprise all at once would incur great risk and a very large investment. The payback is uncertain. (See Figure 2.)

Some companies have changed their internal work flow at the same time that they introduced imaging technology to the entire organization. They've spent years in the planning stage. Investments have exceeded a million dollars. In-house personnel costs spent on training users and supporting installation are enormous and often unmeasured. The goal of course is dramatic and radical change to overhead costs associated with handling and processing paper. However, results are very difficult to measure when so much changes all at once. Favorable payback calculations often depend on soft dollars, such as

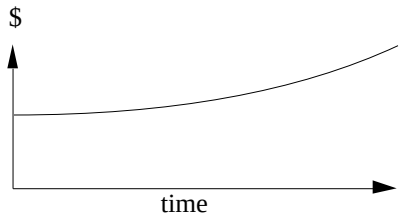

Fig. 1. The cost of making no changes to a business task. Inflation gradually drives the cost up.

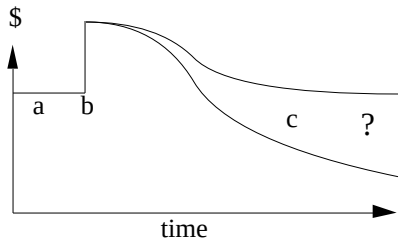

Fig. 2. The cost of implementing a radical change to a business task. a) The planning phase is long, b) the implementation cost is large and c) results are uncertain.

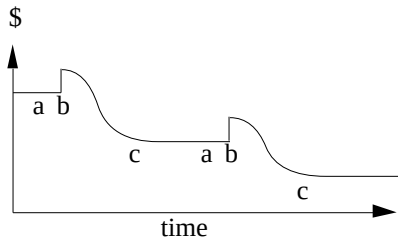

Fig. 3. The cost of implementing incremental changes to a business task. a) The planning phase is contained, b) the implementation cost is reasonable and c) the results are observed prior to making the next change.

assigning a high dollar value to ‘better control over the business process’.

A key to the successful implementation of a large system is the minimization of risk through incremental change, an approach that meets two seemingly incompatible goals:

- Set long term goals and work toward them. Avoid making quick changes that later appear to be short sighted.
- Contain expenditures and show a quick pay back on all investments. Avoid large high risk investments that attempt to change too much.

These goals are both met when a vision of the long term future is partitioned into discrete steps which each step providing a benefit. A well understood incremental change is implemented that can be shown to increase productivity on its own. The benefits of the new technology are then expanded when and if it is appropriate. (See Figure 3.)

Applying an incremental change approach to imaging systems starts with clearly defining a task that is dominated by the mechanics of moving and storing paper or microfilm. The task should be contained so that one or a few imaging systems can make the task more efficient. This type of a pilot program can be very cost effective, with paybacks well under two years. After observing and understanding the results of the pilot, additional systems, network interfaces, jukeboxes, database interfaces (e.g. to a central computer system) can be added according to your organization's priorities.

An imaging system should not *require* any change to your carefully tuned work flow, your personnel in place, existing central computer software nor installed hardware. When you avoid “changing the world,” the investment level is contained, risks are minimized and learning time is very short.

III. Owning the Solution

Discussions surrounding grand expectations of a new system that failed to materialize are all too common. For example, users of a new system may feel that essential features were neglected and are they are disappointed. The vendor's technical staff feels their sales staff was not clear enough when selling the system. Consultants involved in the front end analysis are often long gone. Each person involved is expert in one view of the project, but not fluent in the others.

This problem is classically described as a communication problem. The most common solution is to formalize the communication procedure from the users down to the implementers. Figure 4 illustrates the steps involved. The process starts off by specifying what is needed (an RFP or Requirements

Specification). The requirements document drives more detailed technical specifications. Review and sign-off rules are instituted. Improved communication helps ensure that a new system achieves the desired goals, but those familiar with the design of high technology complex systems know that no finite amount of specifications will ever cover all of the decisions that are made during the day to day process of engineering the system.

What is needed is a person who is familiar with both the business goals and the underlying technology. A person who already understands imaging technology should spend enough time with the end customer that he has a solid understanding of their business process and the need to improve efficiency. The same person should be involved in the day to day implementation of the solution. That person then *owns the solution.* He is willing to stand up and state that he understands the business goal and understands the technology and will deliver a solution that works.

This is where small companies have a strong advantage. They are willing to spend the time with each customer to understand what is needed. The customer has direct access to the principals in the company who in turn are in direct control of the day to day management of the staff and the product. When the system is installed, the person who owns the solution is there to ensure that the business goals are met. He has been closely involved with the entire project and is very well positioned to evaluate and consult on the next incremental change to the imaging system installation.

Large companies have an advantage in the bottom layer of the model illustrated in Figure 4. Research in hardware technologies and setting up efficient automated assembly lines require very large investments that are not typically available to small companies. Large hardware manufacturers have strengths in specific technologies and offer sophisticated components that reflect their strengths. To increase sales, some large manufacturers bundle their components into 'systems'. These systems are constrained to use as many components as possible from the parent company and are not necessarily the best fit for your business needs. To ensure that you are getting the best hardware to meet your need, the system integration and software providers should independent from the hardware manufacturers.

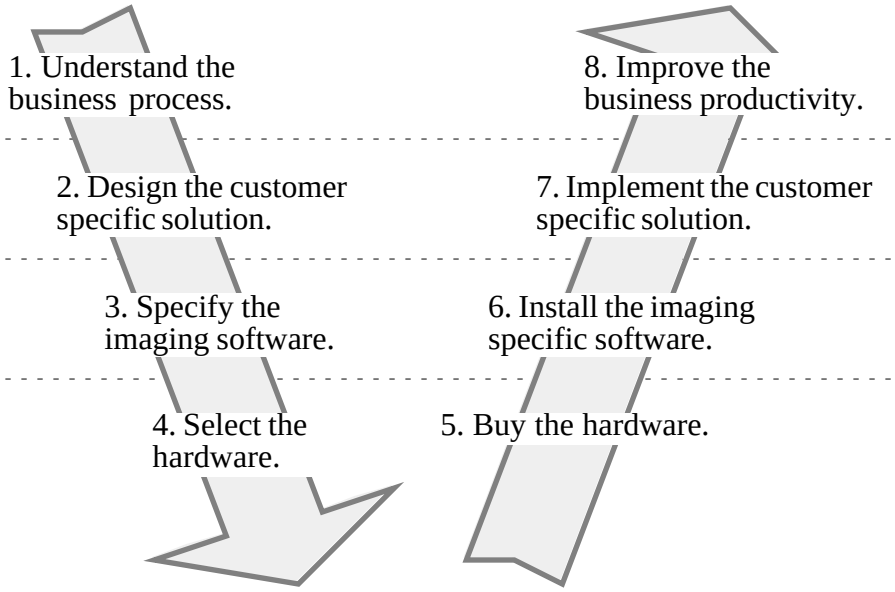

Fig. 4. The process of specifying (downward arrow) and implementing (upward arrow) an imaging system. The best results will be obtained if the top three layers (steps 1-3 and 6-8) are directly managed by one or two people while the bottom layer is freely selected from as wide a number of vendors as possible.

IV. Standard Interfaces

With the system integrator free to choose the best hardware on the market, your first line of defense against obsolescence is in place. After a few years of use though, your needs may change and technology may be available to improve imaging systems. How can you plan to accommodate an unknown future?

Support of standards has become so trendy recently that it is almost seems like a cliché. But one of the real reasons that standards are important is protection against obsolescence. Wherever possible, the interface between two components should be a standard interface. A standard doesn't just mean a currently popular product from a private company. Those ‘standards’ do not have a long life. A robust standard must be *supported* by many vendors. Preferably the *definition and evolution* of the standard is controlled by many vendors. This often requires the support of a third party such as ANSI, IEEE or the DoD.

As an example, assume there are two different imaging systems that both use current technology laser printers. Four years from now, you want to upgrade to a new printer. The first system uses an industry standard interface to connect between the computer and the printer. The upgrade task requires finding a new printer that supports the same standard. Suppose the second system uses a special dedicated link from a proprietary card in the computer to the laser engine. Upgrading the printer would require extensive re-engineering by the imaging system vendor (i.e., selection of a new printer, replacement of the proprietary card, writing a new driver and finally modification of the imaging application to support the new driver). The difference in the cost of upgrading these two systems is so large that the system with the proprietary interface may not be considered upgradable at all.

The most important standard of all is the one used to store your document images. The value of your images will exceed the investment in the imaging system itself after a few years. If the images are stored in a proprietary format, you are tied to the original vendor for the entire life of the documents. Images must be stored in a TIFF format (the multi-vendor definition of how to store images). Then other computers and other software applications can read and display your images in the future.

V. Conclusion

There are always risks involved in making any change from an old technology to a new technology. By understanding how these risks apply to imaging systems, they can be managed and minimized. Successful imaging installations can begin to payback very quickly and have an ROI of well under two years. Incremental changes to the whole imaging installation can then ramp up to more thorough utilization of imaging technology wherever it is cost effective. q

---

The author is with Acordex Imaging Systems (978 352-5500), a product development and system integration company specializing in high performance document management systems. http://www.acordex.com