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# Managing Documents with Imaging Technology

August 1993

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Implementing Imaging at the  
Alaska Judicial Council

alaska judicial council

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**SJI**

State  
Justice  
Institute

*Managing Documents with  
Imaging Technology*

*Implementing Imaging at the  
Alaska Judicial Council*

August 1993

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# Table of Contents

<b>I. Introduction</b> .....	1
A. The Alaska Judicial Council .....	1
B. The Need for Change .....	1
C. Project Summary .....	3
<b>II. An Overview of Imaging Technology</b> .....	7
A. Imaging: A Variety of Solutions .....	7
B. Imaging: A Variety of Components .....	8
1. Document Management .....	8
2. Database of Information in Documents .....	9
3. Imaging .....	9
4. Text (as Opposed to Image) Storage .....	9
5. Optical Character Recognition (OCR) .....	10
6. Networking .....	10
7. Electronic Mail .....	10
8. Fax .....	11
9. Workflow .....	11
C. Imaging: The Benefits .....	11
D. Imaging: The Problems .....	12
1. Implementation Problems .....	12
2. Paper is Sometimes Better .....	12
3. Illusory Time and Cost Savings .....	13
4. Staff Resistance .....	13

5. Out-of-date or Discontinued Products . . . . . 13

**III. Project Evaluation . . . . . 15**

A. Goals Related to the Judicial Council’s Imaging Project . . . . . 15

1. To Implement a Document Management Imaging System 15

2. To Have a Relatively Easy-to-Use System That Staff  
Feel Comfortable Using . . . . . 15

3. To Retrieve Documents Faster . . . . . 18

4. To Use Documents Simultaneously . . . . . 20

5. To Locate Documents in Ways Not Possible with  
Paper Filing Systems . . . . . 20

6. To Have a System That Will Function without  
Frequent Maintenance by Specialists . . . . . 21

7. To Have Access to Both Scanned-in Images of  
Documents and Text/Data Documents Such as  
WordPerfect for Windows Files . . . . . 21

8. To Use Imara as a Form Library . . . . . 22

9. To Better Respond to Public Inquiries . . . . . 22

10. To Save Storage Space . . . . . 23

11. To Save Filing Time . . . . . 24

12. To Implement an Imaging System That is Cost and  
Time Effective . . . . . 25

13. To Improve the Processes by Which the Council  
Staff Complete Their Tasks . . . . . 29

14. To Provide Assistance to Others . . . . . 32

B. Goals Only Indirectly Related to Imaging . . . . . 33

1. To Use a Local Area Network to Allow Staff to  
Better Work Together . . . . . 33

2. To Use E-Mail to Allow Staff to Better Communicate . . . 34

3. To Use the Imaging Hardware to Improve Office  
Productivity in Other Areas . . . . . 34

C. Goals Still Pending . . . . . 34

1. To Add an Optical Disk Jukebox . . . . . 35

2. To Add Optical Character Recognition and Full  
Text Search Capability . . . . . 35

3. To Use the Fax-In Capability of Imara . . . . . 35

4. To Experiment with Workflow . . . . . 36

5. To Create a Selection and Retention Database . . . . . 36

6. To Create a Table/Chart Research Cabinet . . . . . 37

**IV. Conclusions and Recommendations . . . . . 39**

Preparation . . . . . 39

Evaluation and Purchase . . . . . 40

Implementation . . . . . 41

**Appendix A:**

External Evaluation of a New Document Imaging  
System at the Alaska Judicial Council (Prepared by  
Jack Kruse, Ph.D.)

# I. Introduction

This report describes implementation of a document management imaging system by the Alaska Judicial Council. The report is the second of two reports describing this project. The final draft of the first report was issued in April 1993<sup>1</sup> and described in detail the process of evaluating imaging software and hardware, as well as the specific products which the Council evaluated.

## **A. The Alaska Judicial Council**

The Alaska Judicial Council is a small state agency charged by law with: (1) screening and nominating judicial applicants; (2) evaluating the performance of judges and making recommendations to the voters on whether the judges should be retained; and (3) conducting studies and making recommendations to improve the administration of justice in Alaska. Despite its small size—six permanent employees—the Council has generated tens of thousands of documents over the thirty years of its existence. Furthermore, documents are being generated at an ever increasing rate.

At the start of its imaging project, the Council staff was already relatively computer literate. Staff were equipped with 386 computers and used WordPerfect software and other applications in the Windows environment. While the computers shared a printer, they were not connected by a local area network.

## **B. The Need for Change**

The genesis of the Council's document management imaging project was a belief by the Council's director that staff did not have adequate access to the records necessary for the review of judicial applicants and judges. Full and easy access to a wide range of

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<sup>1</sup> "Managing Documents with Imaging Technology - A Review of the Computer Software and Hardware Evaluated by the Alaska Judicial Council" (hereafter "Managing Documents with Imaging Technology"), published in April, 1993.



both current documents and documents from prior evaluation of an applicant or judge was essential to the evaluation process. Access was inadequate for several reasons.

First, the ever increasing volume of materials made organization and retrieval of documents increasingly time-consuming and difficult. Often, the only person who could find a file was the person who did the filing. When that person was sick or on vacation, some tasks simply had to wait. The increasing volume of files also impeded access by forcing storage of some documents on another floor of the building and even off site.

Second, a file sought by one staff member many times was in use by another staff member. The second staff person wasted time looking for the file, and after finding it still had to wait for the first staff person to complete work with the file.

Third, a paper filing system simply did not allow practical access to documents in some situations. For example, the Council filed reference letters in the file of the applicant the letter concerned. However, it was sometimes useful to view a reference letter in the context of other letters that person had written for other applicants. Short of filing a second copy of reference letters by the letter writer—which the Council did not do—a paper filing system did not allow such comparisons.

Not only was access to necessary documents difficult and time-consuming, it also was expensive. Shortly before this project began, the Council was forced to add an additional filing room to its offices. Further, while harder to quantify, the time spent by both professional and clerical staff looking for documents was significant.

Finally, the problems faced by the Council were only likely to get worse. Staff attempts to provide progressively more thorough information on judicial applicants with each new vacancy. This results in more documents for each vacancy, while documents from prior vacancies also must be retained.

Perhaps most significant, Alaska faces substantially reduced state revenues over the next decade because of the gradual reduction of oil reserves in Alaska. At best, the Council's budget will be squeezed on one side by increased costs by inflation, and on the other by tighter state budgets. It was essential to act now to make Council staff as efficient as possible.

This quest for efficiency and effectiveness extended beyond simply finding necessary documents. Staff hoped to create shared documents more effectively through

use of a network, improve communication with e-mail, and rethink the process of accomplishing tasks in a multitude of ways.

### **C. Project Summary**

The factors discussed above led to initial work on a document management imaging system in July 1991. The initial goal was to use programmable database software to create a specialized application by which Council staff could electronically store and retrieve documents for the judicial selection and retention processes. However, it quickly became apparent that existing database software did not have the capability of supporting a document management imaging system.<sup>2</sup>

Staff did discover that there was commercial document management imaging software available. We spent approximately a year attempting to identify and evaluate these products, as well as the related software and hardware necessary for an imaging system. This process was extremely time-consuming and difficult. Simply identifying the products was close to impossible. Small-scale imaging software was a new and still developing area—and still is to a great extent. Eventually, we were able to identify about twenty products which seemed to at least partially address our needs.

The Council applied for and received a grant from the State Justice Institute (SJI) in the winter of 1991/1992. In addition to providing needed funds to implement the imaging system, the grant, and more critically the fact that we would be reporting to hundreds of potential buyers, helped us immeasurably in convincing imaging software companies to let us test their systems in our offices.

The results of our evaluation of imaging software, including related software and hardware, was included in the Council's first report based on this project.<sup>3</sup> We believe based on feedback from this report that it provides an extremely useful guide and

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<sup>2</sup> This is not necessarily true today. For example, a company called TeamWork Technologies recently released software called Paper Bridge which apparently gives a full imaging ability to Microsoft's Access database for an introductory price of only \$100. The company's telephone number is 800-532-3198.

<sup>3</sup> "Managing Documents with Imaging Technology," *supra* note 1.

overview of imaging software and hardware which was previously not available from any source.<sup>4</sup>

The Council purchased an imaging software product in June, 1992, and installed the system in August. The time between purchase and installation was used to select related hardware and software such as a scanner, optical drive, large monitors and database software. The process of selecting these items was described in the Council's prior report.

In the year since installation of the imaging system, staff have focused on four general tasks. A major effort was—and to a lesser extent still is—required to get all parts of the system running and to work out "bugs" in the system. It cannot be emphasized too much that imaging technology is a new and developing technology which, unlike something like a word processing application, is anything but "plug and play." This is particularly true when a local area network is implemented with the imaging system.

Many of the problems faced had nothing directly to do with the imaging software. Problems involved monitors, video drivers, scanners, fax cards, network servers, other components of the system, and, more than anything else, how the multitude of components worked together. Nevertheless, with the help of technical assistance from Imara and the other vendors, staff has solved the problems that have arisen. Further, the problems have clearly decreased over time, although not disappeared.

The second task in the last year was to decide how to organize and index documents on the imaging system. Staff meticulously reviewed the documents saved, particularly in the judicial selection and retention evaluation areas, to decide how to logically organize the documents for later retrieval. By carefully completing this step, staff ensured that users will be able to easily find documents on the imaging system. The added benefit of this process was that staff became much more familiar with the documents the Council has stored over the years and better able to use those documents in judicial selections and retention evaluations.

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<sup>4</sup> Any discussion of background materials for imaging technology must include a recommendation to join the Association for Information and Image Management (AIIM), 1100 Wayne Avenue, Suite 1100, Silver Springs, MD 20910-5699; 301-587-2802; FAX 301-587-2711. Numerous informative publications are available through membership and the AIIM bookstore. Finally, a trip to an AIIM conference to attend seminars and view a wide variety of imaging products is extremely useful.

The third task was to scan paper documents into the imaging system and to import word processing documents. Scanning was completed by a temporary employee hired with grant funds and importing was done by all Council staff.<sup>5</sup> Approximately 100,000 pages now have been entered into the imaging system. All reading files and judicial selection documents, as well as about half of retention evaluation documents have been scanned and imported. In addition, various other research and administrative files have been entered on the system.

Finally, staff have learned to effectively use the system in numerous ways, only the first of which was learning how to find and retrieve images on the system. For example, it is much more efficient to review paper files rather than use the imaging system when reviewing numerous documents kept in one accessible paper file folder. Staff learned to answer phone inquiries by finding and reviewing documents in Imara and by faxing relevant documents from within Imara while on the phone. Staff also adjusted the way of accomplishing tasks to take advantage of the imaging system and such capabilities such as e-mail and network file sharing. These changes are more fully discussed in the evaluation chapter of this report.

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<sup>5</sup> See pages 9-10, *infra* for a discussion of importing versus scanning.



## II. An Overview of Imaging Technology

This chapter provides a brief overview of imaging technology. It begins with a description of imaging technology, including a discussion of the various levels of solutions available. It next emphasizes the wide variety of components of imaging technology which otherwise might be overlooked. The chapter concludes with a look at the benefits and the (sometimes underemphasized) problems of imaging technology.

### ***A. Imaging: A Variety of Solutions***

Imaging technology is, at its simplest, the ability to electronically store, organize and retrieve documents. Documents generally are entered into a system by using a scanner to take a picture of the document. The imaging software then allows the user to attach index words to the picture for later retrieval. Next, the picture is stored in a database that more often than not resides on an optical rather than hard drive. Finally, the imaging software allows the picture to be retrieved and viewed on the computer monitor.

Vendors such as IBM and File Net have offered large scale and very expensive imaging solutions for quite a few years. For example, several large insurance companies use these systems to keep track of claims documents. Such systems are individually designed and implemented by the vendor for each buyer. The systems have numerous advantages, but were many times too expensive for the Council to even consider. Furthermore, large custom systems have other disadvantages. They usually are quite proprietary and often have less flexibility than cheaper systems.

The Council concentrated its evaluation on smaller scale imaging software available anywhere from a few hundred dollars to about \$20,000 for a network of about six users. These products, while not "shrinkwrapped" in the sense of WordPerfect or

Excel, come essentially complete out of the box. Any customization would generally be completed by the user (in the Council's case) or by the dealer installing the software. The capabilities of the software evaluated for this project are covered in detail in the prior report.<sup>6</sup>

## **B. Imaging: A Variety of Components**

As discussed above, imaging technology at its simplest is the ability to electronically store and retrieve documents. However, this capability is actually only a very small part of what imaging software now has to offer. These components discussed below are actually in many cases more important than the pure imaging component.<sup>7</sup>

### **1. Document Management**

Imaging software is perhaps first and foremost a computerized system for organizing and keeping track of documents. This component is not even necessarily related to "imaging," and could be useful even if all documents were to remain paper files in filing cabinets. The software allows the user to find documents by which folder/drawer/cabinet the file is in (whether electronic or not), as well as find documents by keywords, dates or other special index fields.

Adding the folder/drawer/cabinet as well as keywords and other information to the computerized document management system is a necessary but difficult and time-consuming part of establishing an imaging system. This task requires a great deal of effort to be spent reviewing the organization of current files and deciding how the files can be referenced better by a computerized document management system.

However, the time spent designing and implementing a computerized document management system can be well worth the effort. Council staff have become tremendously more familiar with Council records through this process. Staff now knows much more about the documents on file, and can use this knowledge to better complete day-to-day tasks.

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<sup>6</sup> "Managing Documents with Imaging Technology," *supra* note 1.

<sup>7</sup> *Id.* This section is essentially repeated from this prior report. However, the concept covered—that imaging technology consists of a broad range of components—is essential to understanding the implications of imaging technology.

## **2. Database of Information in Documents**

This second component of imaging software, just as the first, is not necessarily related to electronic storage and retrieval. Here the objective is to create a database of information in documents--not to find them as was the case with the document management component, but primarily to answer questions that arise without having to look at a document. Very few imaging systems include the ability to create such a database. The Council concluded that it was a significant feature.

In practical terms this database creates the capability to store information in user-created fields at the file folder rather than document level. For example, the Council has many documents for each judicial applicant that are organized into file folders named for the applicant. The Council's imaging software, Imara, allows information to be saved about each applicant in a separate database. This step should minimize the need to look up multiple documents, which even on the computer will be more time-consuming than looking in the database. Also, staff could statistically analyze the information about applicants, and could use the database to automatically produce the summary sheet on each applicant for the nomination process that now is done by hand. However, the Council has not yet implemented this feature.

## **3. Imaging**

The actual imaging component of the software is relatively straightforward. Once a document is located using the "document manager," and assuming staff still need to see the document itself rather than the information also on the "database," an imaging capability allows the user quickly to view an image of the document. Documents are entered into the system by scanner, fax or importing image files. The electronic documents usually are stored on optical disk storage devices. The imaging capability saves both staff time to retrieve paper files, and storage space.

## **4. Text (as Opposed to Image) Storage**

The imaging component of the software stores and retrieves images of documents. However, many imaging products also will store and retrieve application files containing text or data, and will automatically launch the software that created the document when it is retrieved. For example, most of the Council's current documents are created by Council staff using WordPerfect for Windows. Imara allows storage and retrieval of these documents as WordPerfect files, saving considerable disk space and scanning time,



and allowing easy updates of documents when, for example, a judicial applicant applies for a second vacancy.

## **5. Optical Character Recognition (OCR)**

OCR allows images of documents (or parts of documents) to be converted into text. The only alternative, assuming this conversion is necessary, is to retype the document. OCR can be used by imaging software in three ways.

First, OCR can allow small zones in a document to be converted into text for index fields so that the document does not have to be indexed by hand. This can be a tremendous timesaver if an organization uses forms in which zones for fields can be standardized. The technology for this type of OCR works fairly well.

Second, OCR can allow all or part of a document to be converted into text so that a full text search capability can be used to find information. While OCR may make many mistakes even on relatively clear documents, it is accurate enough to constructively use in this regard.

Third, OCR theoretically can replace an image of a document with text. However, the document should be in near perfect condition with a standard layout. Otherwise, it is almost always easier to retype the document if it must be mistake-free. On the other hand, OCR technology is making rapid strides towards improving recognition accuracy.

## **6. Networking**

While imaging software can be installed on a standalone computer, imaging technology is much more useful when available on a network. More than one user can have access to documents, even simultaneous access, at the user's desk. A network also allows the use of other applications such as e-mail and workflow, which are discussed below.

## **7. Electronic Mail**

In most organizations, documents are not simply retrieved and refiled by individual users. Rather, a document must go through a process of review by multiple users, each of whom may have comments about the document. Imaging software with an e-mail component allows documents to be shared electronically. Such software, in

addition to allowing documents to be electronically routed, usually allows written or even spoken notes to be attached to documents. The e-mail capability in imaging software probably will develop soon into one that hooks into general e-mail packages such as Microsoft Mail. This advance will make e-mail much more useful than the current proprietary solutions.

### **8. Fax**

This capability in imaging software allows documents to be electronically shared with others outside the office much like e-mail allows sharing within the office. Staff found this quite useful in responding to public inquiries. Further, the component allows documents to be entered into the system directly by faxing, rather than by submitting paper documents that then must be scanned.

### **9. Workflow**

Workflow is a component of certain imaging software systems which allows repetitive tasks requiring document routing to be standardized. For example, the Council regularly screens and nominates judges. Workflow components would allow an electronic message to be sent to a staff member whenever a task needed to be completed. The message could include instructions, a copy of any documents necessary to complete the task, and a deadline.

Much of the literature on imaging systems emphasizes the workflow component of imaging as more important than everything else put together. While this conclusion depends on the type of tasks an organization has, workflow allows an organization not only the opportunity to perform those tasks more effectively, but also the opportunity to review and improve the organization's work processes.

## **C. Imaging: The Benefits**

The benefits of an imaging system have been for the most part already alluded to. An imaging system can allow virtually instantaneous access to documents. It can allow multiple users to access documents simultaneously. It can allow access to documents through multiple methods of indexing, something that is not practical with a paper filing system.

An imaging system can save money by saving staff time in retrieving documents. It can also save money spent on office space by allowing paper files to be destroyed or warehoused, and minimize the need to store new paper files.

Perhaps the greatest benefit of imaging is that it requires an organization to carefully review what documents it keeps, how these documents are organized, and how the documents are used to accomplish the organization's aims. Such an effort, even completely divorced from implementing an imaging system, is bound to result in a significant improvement in the ability of an organization to accomplish its goals.

Further, each of the components of imaging discussed above result in benefits ranging from small to substantial. For example, an ability to fax out documents from an imaging system can be quite useful. Clearly, the ability to operate on a network brings numerous associated benefits.

#### ***D. Imaging: The Problems***

While imaging systems have clear benefits, they also entail substantial problems—problems which may be glossed over by vendors and industry literature. This section attempts to at least identify some of these problems.

##### **1. Implementation Problems**

The perhaps most significant problem with imaging systems results from the fact that the technology is so new and complex. Users will almost inevitably run across major problems installing the systems and breaking them in. Good vendor support and some in-house expertise, at least with PCs, generally are essential.

##### **2. Paper is Sometimes Better**

Council staff have discovered that for certain types of tasks, it is much easier to work with paper documents than electronic images. One situation is when a very long document, such as a writing sample, must be reviewed. Viewing technology simply does not quite match looking at a paper document. The difference is not significant when reviewing a few pages here and a few pages there. It is significant, however, in long documents that must be read closely.

Also, it is easier to review a paper file if the file contains numerous documents that must be reviewed. However, if the paper documents are in different folders or are hard to find, the imaging system is superior.

### **3. Illusory Time and Cost Savings**

The time and money savings promised by imaging systems are to a certain extent illusory. This stems from two main factors. The first is that it takes a significant amount of time to scan or import, and then index documents. This time may even exceed the time necessary to file paper documents.

Second, for various reasons users may want to keep paper documents in addition to document images. There may be legal reasons why some paper documents may be saved. Further, as discussed above, some tasks are simply easier to accomplish using paper documents.

### **4. Staff Resistance**

The implementation of any new technology causes disruption and hence frustrations for staff. This is particularly true for such a complex technology as imaging. Further, while most imaging systems are not terribly complex, they do involve new concepts and a very different way of working with documents. Clearly, staff involvement and education must be an important part of the implementation of any imaging system.

### **5. Out-of-date or Discontinued Products**

Most imaging software producers are relatively small and new companies. Furthermore, this technology is very new and changing rapidly. There is always a danger that a product will not be further developed and will hence become out-of-date. Worse, many of the imaging companies now selling products will probably go out of business in the next few years. Obviously, such companies are to be avoided if possible.<sup>8</sup>

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<sup>8</sup> *Id.*, at pages 28-29.



# III. Project Evaluation

This section of the report evaluates the successes and failures of the Judicial Council's "Managing Documents with Imaging Technology" project. An independent summary evaluation conducted by Professor Jack Kruse, Ph.D. of the Institute of Social and Economic Research at the University of Alaska Anchorage supplements the staff evaluation. Dr. Kruse's evaluation is attached to this report as Appendix A.

The evaluation contained in this section of the report is organized by how well various goals of the project have been accomplished. These goals range from very general to quite specific. This section also discusses several goals that are indirectly associated with the imaging system involving such items as e-mail and networks. Finally, several future goals are addressed.

## **A. Goals Related to the Judicial Council's Imaging Project**

### **1. To Implement a Document Management Imaging System**

The Council has successfully implemented a document management imaging system. Whatever the pluses and minuses of the system, it is at least up and running, and being used. This may appear to be too basic to mention. However, considering the obstacles overcome and the fact that many organizations have attempted to implement imaging systems only to later give up, staff believes it to be significant.

### **2. To Have a Relatively Easy-to-Use System That Staff Feel Comfortable Using**

**a. Training and Ease of Use** — Most Council staff had some familiarity with imaging software before Imara was installed. Key staff had already spent 20 to 30 hours at a minimum evaluating at least half a dozen other imaging systems while the office was deciding which software would be purchased by the Council. Notes taken from a

meeting at which Council staff compared the features and abilities of the top three or four software packages indicate that staff had become familiar enough with all the systems to analyze performance using numerous criteria. This early acquaintance with imaging systems in general meant that they were not typical first time users of the system.

An Imara representative traveled to Anchorage for two days to assist in the installation of Imara at the Judicial Council. He also provided substantial assistance in installing the network and the various imaging peripherals needed for the system. The Council's director and research analyst worked with the Imara representative, gaining substantial familiarity with the system during installation.

The Imara representative spent about an hour with staff reviewing the program's characteristics and abilities. Staff used this as an opportunity to become more familiar in the workings of the program, to bring themselves up-to-date on changes in the system recently made by Imara, and as a chance to find out how to do specific tasks.

Staff were asked to fill out a "new users questionnaire" prior to their first work on Imara. In addition to establishing the expectations staff had for the system, the questionnaire asked for information about preferred training methods and materials. All staff responded that they preferred to learn on an actual project rather than using training materials or programs. Consistent with this preference, most learning about Imara has taken place while staff are using Imara for a specific task.

Almost all of the actual training that has occurred since the first session has come about through one user asking a more experienced user for guidance. Typically, the question is specific and brief, requiring not more than five to ten minutes of assistance. Questions also tend to be relatively infrequent, in part because the uses of the system thus far have been fairly straightforward. As a result, Council staff have spent relatively little time in training, especially in formal training, for use of the imaging system.

Retrieval of documents using Imara is a relatively straightforward and logical process, especially for Council users who were already familiar with the Windows environment. Staff have preferred "on the job" training, familiarizing themselves with the paper files and learning Imara as needed to complete specific tasks. Staff have relied on each other far more than on written materials or on-scene training to answer questions about how the system operates. Manuals have been used infrequently, primarily to answer very specific questions, rather than to learn the operation of the system.

**b. User Satisfaction** — In addition to the "new users questionnaire" mentioned above, staff were asked to complete questionnaires and time logs during their first few experiences with Imara. Users also were asked for comments throughout the project and interviewed by an outside consultant near the end of the project to obtain continuing and varied perspectives on their impressions of the system. Criteria for user satisfaction included willingness or desire to use the Imara filing system instead of the paper filing system, and ease of use.

Overall, staff appeared to be cautiously optimistic about the usefulness of Imara. Substantial difficulties in using the system were balanced by some of the innovations in the process possible because of it, and by a general willingness to be patient with the combination of learning a new system and an initial lack of available documents actually scanned into the system.

Several very specific problems arose in the first year of the imaging system's operation that significantly affected staff's satisfaction with the system. First, for financial reasons the computer used for the network server initially also was used for the imaging server and the scanning station. As a result, whenever large numbers of documents were scanned into the system (as they were at least several hours a day), operation of the network slowed to a crawl. This affected not only use of Imara, but also use of many other applications.

This problem was solved in late June, 1993, by adding another computer and moving the scanning station to it. By separating the scanning station from the network and image server computer, the problems discussed above have disappeared.

The second significant problem that plagued the imaging system, especially during the first six months of operation, was the fact that the network "crashed" numerous times for usually unexplained reasons. Apparently, most of these crashes were simply related to working the "bugs" out of a combined local area network and imaging system. The fact that the network server, the imaging server and the scanning station all resided on the same computer probably contributed to the problem. However, the problem has gradually receded over time and currently network crashes are a relatively rare event.

Third, and perhaps most vexing, was a "bug" in Imara that increasingly slowed down the retrieval of documents on the imaging system workstations. Initially, a selected document appeared on a workstation monitor screen within a few seconds from when



the document was selected. However, as thousands of pages of documents were scanned into Imara over several months, retrieval time gradually began to deteriorate on the workstations (although not from the server computer). By the time about 90,000 pages had been entered onto the system, retrieving the first page of a document took about seventy seconds. (Note that viewing the second or subsequent pages of a document still only took about three seconds.)

In one sense, complaining about a retrieval time of slightly more than a minute when the retrieval of paper files had often taken hours or days seems illogical. Clearly, staff had been spoiled to a certain degree by the initial fast retrieval times. However, the problem was extremely serious and in fact made use of the system increasingly impractical when multiple documents had to be retrieved to accomplish a particular task. For example, follow-up calls to references required that a document or two be reviewed for each call. The time spent waiting for documents to appear quickly exceeded the time required to find the paper files. Thus, this problem seriously impeded use of Imara for a significant time during the first year of the project.

Imara provided the Council with a fix to this problem just as this report is being finalized. Documents now can be viewed from workstations in about five seconds (it takes only two seconds to go to another page within the same document), even though there are approximately 100,000 pages of documents on the system. This substantial improvement should encourage substantially greater use of Imara and allow fuller integration into office routines.

In spite of the significant problems discussed above, users appeared relatively satisfied with the Imara imaging system. As discussed elsewhere in this evaluation, there have been a variety of positive effects of using Imara, some directly related to imaging and some not. For example, staff are looking forward to future projects relating to creating databases that permit ready access to the Council's research or to analyzing the judicial applicant database to be compiled in conjunction with entering the judicial selection and retention files. The increasing ability to carry out projects such as these, together with the correction of the significant implementation problems should improve significantly overall staff satisfaction with the imaging system.

### **3. To Retrieve Documents Faster**

Overall, the imaging system has helped Council staff retrieve documents faster. This is especially true now that the bug affecting retrieval times on Imara has been

eliminated. Another aspect of the success in meeting this goal is that documents are usually easier to locate in the Imara filing organization than as paper files. Partly because staff has taken a significant amount of time to discuss how to file documents in Imara, and partly because Imara provides a logical filing system, staff can locate documents in the Imara filing system relatively quickly and easily.

To find a document in the paper filing system, staff could either look for it themselves, or ask one of the two or three staff people who were relatively familiar with the system to find it. During June and July of 1992, staff tracked the time required to find documents in the paper filing system. Forty separate entries were made on staff logs. Items that took one minute or less to retrieve typically were on the desk of the person who was looking, or of the person who was asked to look. Some correspondence that was in files and a few reports, along with other material on people's desk or in their offices was found in less than five minutes. In all, 35% of the material searched for was located in less than five minutes.

From the standpoint of training, one of the most notable results of the paper file retrieval experiment was the frequency with which the person seeking the information needed to ask for assistance from another person to find the file. The two staff who use the files most frequently requested the assistance of another person only three times out of thirteen searches (23%). For other staff, requests for assistance ranged from 50% to 83%.

The modal search for a document (n=15, or 38%) required 5 to 10 minutes. Some of the searches appeared to be slightly more complex, involving larger amounts of materials, but by no means all of the needed materials that took a long time to find were complex. Files typically were not found in under five minutes.

Over one-quarter (27%) of the searches involved more than ten minutes. Of those, a number were fifteen minutes, a few were about one-half hour and several were over one hour or even a day. Some of the long searches, and a few of the shorter ones, ended without locating the document desired, but for the most part, all documents eventually turned up.

Analysis of the tracking sheets revealed that very often, the materials needed were not in any file, and certainly not in a filing cabinet. They were in someone's office, on

a desk, or in that person's personal filing system, or in a box under a table.<sup>9</sup> Sometimes, the search for one document turned up others, serendipitously, that staff had been looking for in conjunction with a different project. All of this suggests that even a thorough familiarity with the filing system could not help in retrieving a high percentage of the materials sought. Further analysis of materials requested by staff may help in deciding what types of materials should be entered over the long run into the imaging system, since some of the materials needed were not the ones that have been entered so far into Imara.

#### **4. To Use Documents Simultaneously**

One clear advantage of imaging systems over paper filing systems is that several users can review documents simultaneously on electronic systems. This simplifies finding files. For example, when the Council is working on a judicial selection, the paper files for the applicants often were in one staff member's office when another staff member had to complete a particular task. Thus, this capability of electronic imaging systems assisted staff in completing each of their respective tasks with relation to the limited number of files for a particular judicial selection.

#### **5. To Locate Documents in Ways Not Possible with Paper Filing Systems**

As briefly discussed above, it is sometimes useful to locate files apart from the particular judicial applicant to which they relate or the particular judicial selection to which the documents relate. For example, in Imara the name of the person sending a letter or document to the Judicial Council, or the name of any person or organization to whom we send a document outside the Council can be saved as an index key. The name can be used to find a document when the user knows who the document was sent to or came from, but is not sure what folder it may be filed in.

A recent judicial selection illustrated a related use of this feature. Two judges had written letters of recommendation for applicants. Judge #1's letter was very short and matter of fact and clearly could be interpreted as "damning with faint praise." However,

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<sup>9</sup> One set of staff notes was particularly revealing. For the seven entries, the "notes" column read as follows: (1) "I always keep a copy on my desk;" (2) "on my bookshelf;" (3) "in a box, under table in file room;" (4) "couldn't find a copy in my files, \_\_\_\_\_ keeps a copy;" (5) (this one was blank); (6) "not in my files, didn't have either;" and (7) "finally found by going through \_\_\_\_\_'s desk." In short, the regular filing system was apparently never once called into service or was actually useful in responding to any of these requests.

after viewing a variety of letters that the judge had sent about past applicants—something that would not have been possible in the paper filing system—it became apparent that that judge simply did not write very effusive recommendation letters. On the other hand, Judge #2's comments were much more detailed and positive, although they seemed to be a bit restrained. A comparison of that judge's previous letters showed that the judge never said anything bad about anyone and led to the clear implication that the letter in question was not a particularly good recommendation considering its source.

#### **6. To Have a System That Will Function Without Frequent Maintenance by Specialists**

This goal appeared in the initial concept paper addressed to the State Justice Institute. While implementation of the imaging system has clearly not gone as smoothly as hoped or expected, the bottom line is that Council staff have maintained the system with only telephone assistance from Imara, except for the initial two-day installation of the system. However, the Council does have considerably more in-house computer expertise in its research analyst than many even larger organizations would have.

The frustrations of implementing an imaging system have been discussed previously in this report. While these frustrations have been very significant, they have decreased very substantially over time. At present, the Council's system functions without frequent maintenance by specialists and with increasingly infrequent intervention by in-house staff.

#### **7. To Have Access to Both Scanned-in Images of Documents and Text/Data Documents Such as WordPerfect for Windows Files**

The Council discovered very early in this project that its staff create a high percentage of the documents that go into the imaging system. Most originate in WordPerfect for Windows. An initial goal of the project was to implement an imaging system that could save these documents as WordPerfect for Windows files rather than scanning them into the system as images. This goal has been successfully achieved.

There are several advantages to this approach. First, saving documents in Imara as text/data files takes about one-tenth the storage space as scanning in documents as images. Second, saving documents as, for example, WordPerfect for Windows files allows those documents to be searched for using a full text search capability and

subsequently used and updated as text/data files. This latter ability is discussed in the next subparagraph.

## **8. To Use Imara as a Form Library**

One function of imaging that was not initially apparent was creation of a "filing cabinet" in Imara to store WordPerfect for Windows forms relating to judicial selection, and retention. Most of the hundreds of documents that the Council creates for judicial selection are standard requests for information, such as credit reports, and reference letters. By using forms kept in Imara in a "read-only" format, the process of completing the tasks for a judicial selection is drastically simplified. While the Council's executive secretary had a "forms library" on her computer before the Imara system was implemented (and still uses this resource), that forms library is now expanded and standardized. Further, it is easily available to all staff so that tasks can be completed even when the executive secretary is out of the office.

Other types of documents stored in Imara also can serve as forms. For example, one staff member prepares meeting minutes for a state court committee revising Alaska's child support guidelines. Using the prior meeting minutes as a starting point, a laptop at the meeting allowed someone with little typing ability to nearly complete a dozen pages of minutes within an hour after the meeting finished. The secretary then formatted and completed them quickly.

## **9. To Better Respond to Public Inquiries**

The Council routinely takes calls from members of the public, court staff, judges or other persons with questions about Council business. Past calls often involved questions about documents that were not easily available. A staff member had to find the files later, often with the help of another staff member, and then call the person back, often playing telephone tag several times. If the person wanted copies, these had to be mailed out, typed by support staff.

The imaging system has dramatically improved Council staff's ability to respond to such inquiries. Often, a document can be pulled up on Imara almost immediately and reviewed during the phone conversation. There is no need to do further research, enlist other staff persons to find the document or to call the person back later. If the person inquiring needs a copy, the staff person can simply drag the document in Imara to an icon of a fax machine. A screen then appears asking for the recipient's name and fax

number. The document can arrive at the fax machine before the caller hangs up the phone.

## **10. To Save Storage Space**

Shortly before the Council installed its imaging system, it was forced to add a new file room to its offices at the cost of \$5,039 per year. However, this new filing room immediately was overfilled by a factor of two. To implement the imaging system, staff had to review all existing paper files. After scanning these into Imara, many of the paper files were sent to storage. The new file room was cleared of excess files and no new space should be needed for years to come, despite ever increasing numbers of documents.

This does not mean an end to reliance on paper files. As discussed above, paper files sometimes are more efficient. Most paper judicial selection and retention files will stay in the Council offices for the foreseeable future. Further, many old research files may be stored as paper rather than imaged because they are used too infrequently to warrant the expense of scanning them into Imara.

The Council has not yet thrown away any paper documents after storing them in the imaging system. Nevertheless, the impact of Imara has been significant. About twenty-five boxes of reading files and other materials have been sent to warehouse storage. These can be destroyed in a few years, after gaining more experience and confidence in the imaging system. Staff plan to ship out more boxes of documents soon. Even old selection and retention files eventually may be stored off-site or destroyed.

In addition, planning the imaging system led staff to closely examine the need for keeping many documents and library materials at all. As a result, about ten boxes of files and library materials have been recycled, and another ten have been donated to the University of Alaska Anchorage.

The bottom line is that in spite of a continuing reliance on paper documents, the imaging project and the review it spawned have enabled the Council to unclutter its limited office space, and accommodate more equipment and workstations. Staff expect to be able to ship out (and eventually destroy) old files at about the same rate that new files are created, for the foreseeable future.

The cost benefit of the space saved is impossible to calculate with precision. Over a five-year period, based on an estimated need to rent a new file room the size of the present one, and to purchase a dozen fireproof, locking file cabinets at \$1,124 each, the cost would be about \$38,000. The balancing costs of the imaging system are discussed below.

## 11. To Save Filing Time

A document imaging system theoretically could save filing time. Clearly, the Council's has not. There are two reasons for this, neither of which is specific to the Council.

First, it takes time to scan and index documents electronically. This evaluation found that filing and indexing a document electronically took a bit longer than manual filing.<sup>10</sup> The filing itself was a bit faster electronically—the difference was that the electronic documents were indexed to a degree the paper documents were not. While this took extra time, it also permitted far better access to documents as discussed above.

Indexing does not necessarily mean electronic filing must take longer. If OCR can be used to index the document automatically, electronic filing would be much faster. Nevertheless, the indexing issue is one that users should consider carefully in deciding on imaging software.<sup>11</sup>

In some instances, the analysis necessitated by the project resulted in filing improvements not directly related to imaging. One example was form letters placed in each applicant's selection file. Filing paper copies of the letters took about a minute per file. Storing the letters in Imara, however, required that the merge file be re-done as a separate file for each applicant, and then imported, a process that took about three

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<sup>10</sup> This held true even after the scan station moved to a separate computer. When the scan station was still on the network server, electronic filing took about 50% longer than paper filing.

Analysis of the detailed records kept by staff indicate that some types of operations did take significantly longer manually. Setting up the initial files for the vacancy and the physical cardboard files, for example, took 149 minutes manually and 26 minutes for the imaging system. Almost all of the extra time spent manually was used in physically putting labels on and page separators into the cardboard files. However, as noted at other points, some of the time that was spent in preparing the paper file folders at the beginning of the process was comparable to time taken later in the process in the imaging system, and should be offset against that.

<sup>11</sup> "Managing Documents with Imaging Technology," *supra* note 1 at 19-21.

minutes per file. Analysis of the procedure resulted in changing the procedure to simply copy the original merge file once to the "general materials for this vacancy" folder created in Imara. Because none of the information was confidential, and because the letters were form letters that were not used in the analysis of the applicant's abilities, there was no good reason to file them in separate files. This is an example of an instance where using a new technology suggested entirely new processes that saved time in both the manual and imaging filing systems.

The second reason that the Council's imaging system has not saved filing time is the need to file and save documents in paper form as well as electronically. To some extent, for example with reading files, this is temporary while becoming familiar with the imaging system. In other situations, for example with selection and retention files, this "double" filing represents a conscious choice as to how best to file documents for the greatest benefit later.

## **12. To Implement an Imaging System That is Cost and Time Effective**

Obviously, a central purpose for using new technology such as imaging should be to allow staff to work more easily and cheaply than without the system. However, measuring cost and time savings is difficult. The degree that the Council's system has fulfilled this purpose is discussed below, for both the short and long term.

**a. Short Term Cost and Time Effectiveness** — In the short term (to the present), the cost/benefit ratio of the Council's system is perhaps 100 to 1. Unfortunately, this means that the cost of the system in time and money exceeds the benefits realized to date by 100 times.

As discussed above, staff spent hundreds of hours investigating imaging software and peripheral equipment. These efforts will make others' tasks easier, but the cost to the Council clearly was substantial. Staff have spent hundreds of hours installing, configuring, optimizing and working the problems out of the imaging system. Staff also have spent many hours planning how to organize files on Imara, scanning and indexing the files, and learning how to use the system more efficiently.

Some time finding documents has been saved, as discussed in the preceding sections. The savings have been limited, to date by, the "bug" in Imara affecting retrieval time. Some time has been saved in preparing new documents because of Imara's ability to make WordPerfect documents available to all staff to use as forms. Finally, the file



sharing, e-mail and fax-out capabilities of the system all have saved time. But the bottom line is that the time spent implementing and maintaining the system has greatly exceeded the time saved.

The same can be said for any cost savings. As discussed above, the estimated cost savings of five years' rent on a file room and purchase of a dozen fireproof file cabinets would be approximately \$38,000. However, the costs of implementing the imaging system exceed the savings.

Table 2 estimates the out-of-pocket costs of implementing the Council's document management imaging system. The hardware and software costs are those paid by the Council. Current prices are often lower. The chart does not include costs of the local area network.<sup>12</sup> Finally, it includes only part of the cost of upgrading each computer workstation to a faster and more capable computer to optimize the workstation's imaging ability.

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<sup>12</sup> The cost of implementing the network was:

Computer for use as server:	5,990.00
Uninterruptible Power Supply (UPS)	295.00
Lan Manager network software:	1,369.00
Windows for Workgroups (6 copies):	320.00
Wiring	2,661.00
Network Adapter Card	<u>152.00</u>
Total	10,787.00

<b>Table 2 Costs of Imaging System</b>	
<b>Imara Imaging Software</b>	
Imara Imaging Software <sup>1</sup>	5,000
Imara Scanflo Software <sup>2</sup>	6,000
Annual Imara Maintenance Fee <sup>3</sup>	664
Installation	2,000
<b>Other Software</b>	
Microsoft SQL Server <sup>4</sup>	1,940
<b>Network Equipment</b>	
Fujitsu 3093 Scanner	3,880
Panasonic 7010 Optical Drive	2,955
Kofax 9200 Imaging Card	2,320
SCSI High Density Cable	50
Gamma Fax CP Adapter	809
<b>Workstation Equipment</b>	
NEC 5FG Monitors (6) <sup>5</sup>	5,100
NEC ImageAccel 1280 Adapter <sup>6</sup>	743
Cornerstone Dual Page 120 Monitor	1,287
Network Adapter Cards(7)	1,064
Computer Upgrade (6 x 1000) <sup>7</sup>	6,000
<b>Personnel Costs</b>	
Temporary Clerical to Scan Documents	11,198
Project Systems Consultant	9,862
<b>Miscellaneous Costs</b>	
Safety Deposit Box for Optical Disk Storage	40
10 Optical Disks	1,823
Imaging Telephone Calls	600
<b>Grand Total</b>	<b>63,335</b>

<sup>1</sup> This amount was for a three-simultaneous-user license. The software is installed on nine computers.

<sup>2</sup> Scanflo is an extra cost module of Imara which allows higher speed scanning.

<sup>3</sup> This annual fee entitles the Council to free telephonic technical assistance and product updates.

<sup>4</sup> A runtime version of SQL Server came with Imara at a minimal additional charge. The regular ten user license was chosen because it allowed independent access to and use of the database.

<sup>5</sup> This is the extra cost of these 17" monitors over the cost of the 14" monitors that would have come with the computers.

<sup>6</sup> This is a specialized imaging video adapter card that allows one 17" monitor to run at a 1284 x 1024 resolution. The remaining monitors run at a 1024 x 768 resolution with the adapters that came with the computers.

<sup>7</sup> As stated above this is a partial cost of the computer upgrade costs that occurred in this project. The partial figure was used for the upgrade of computers from 386s to 486s and additional RAM because these upgrades were scheduled to a certain extent in any case.

<sup>8</sup> These calls were primarily to Imara, but also to many organizations throughout the country who had questions about the Council's project.

While detailing the short-term costs in time and money of implementing the Council's imaging system, staff emphasize that efforts spent on the system, almost paradoxically, did not reduce the Council's output in other areas. During the two years of this project, staff have, if anything, increased output in other areas.<sup>13</sup> This was possible for several reasons.

First, staff was forced to become more efficient when faced with additional workload, and worked many extra hours to complete all tasks. The extra hours were made more palatable by the fact that staff considered the imaging project worthwhile and interesting, and because the Council has a "comp time" policy that allowed extra hours to be tallied. Second, the grant from the State Justice Institute, together with state funds available because of an abnormally low number of judicial vacancies one year made the project financially possible.

**b. Long Term Cost and Time Effectiveness** — The Council believes that the long term (from mid-1993 forward) cost/benefit ratio of the imaging project will reverse the short term ratio. The benefits will substantially exceed the costs. Several factors make this possible.

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<sup>13</sup> Major reports listed in the past two years include:

*A Re-evaluation of Alaska's Ban on Plea Bargaining*  
*Appellate Sentence Review in Alaska*  
*Alaskan Rural Justice: A Selected Annotated Bibliography*  
*Alaska Child Visitation Mediation Pilot Project*  
*Resolving Disputes Locally: Alternatives for Rural Alaska*  
*Resolving Disputes Locally: A Statewide Report and Directory*  
*Managing Documents with Imaging Technology: A review of the computer software and hardware evaluated by the Alaska Judicial Council*  
*Alaska Sentencing Commission 1990 Annual Report*  
*Alaska Sentencing Commission 1991 Annual Report*  
*Alaska Sentencing Commission 1992 Annual Report*  
*Opinions on Sentencing in Alaska: Results of Five Focus Groups*

First, the Council will not have to repeat the enormous effort that was put into evaluating imaging software. Second, the time spent implementing and working out bugs in the system has declined drastically. The time needed for maintenance is minimal, perhaps averaging a couple of hours a week.

Third, 95% of the imaging system has been purchased. The only upgrades planned are an optical jukebox (estimated cost \$10,000) and possibly OCR (estimated cost \$2,000). The other ongoing cost is for optical disks. Of course, the system equipment eventually will be replaced or upgraded but this expense is in the future.

In conclusion, any extra time spent on imaging, primarily extra filing time and system administration, will be more than offset by time saved locating and using documents. Further, rental space and file cabinet savings exceed ongoing system costs.

### **13. To Improve the Processes by Which the Council Staff Complete Their Tasks**

The preceding discussion concerning how much time and money the imaging system saves and costs helps to evaluate the system and the imaging project as a whole. However, in another sense it is almost irrelevant. The real question is not how long it takes to file or retrieve specific documents, but how the system helps staff accomplish their major tasks such as judicial selection, judicial retention and research projects.

Evaluating this aspect of the imaging system requires seeing how the judicial selection process has changed over the past two years, and how it may change in the future. This type of evaluation is necessarily less quantifiable, especially since the imaging project is only one way that the Council has tried to improve its work processes.

The judicial selection process is essentially an employment decision, albeit a complex and involved one. Council staff collect extensive information on applicants and organize the material into packets for the Council members. The Council then submits a minimum of two nominees to the Governor, who must select the new judge from that

list. Over sixty tasks must be completed for each selection, many with multiple steps and substantial effort.<sup>14</sup>

**a. Scheduling a Vacancy** — The first step in the selection process after a judicial position becomes vacant is to establish a comprehensive assignment sheet and schedule for each of the dozens of tasks, deadlines and meetings that must occur. This was done by hand two years ago, taking almost a day of the director's time at the start of each vacancy, as well as further time when the schedule or assignments had to be adjusted.

This task now takes under five minutes. A form project schedule is kept in Imara using project management software. Tasks, task schedule spacing and staff assignments are virtually the same for each vacancy. This form project schedule is saved as a new document and named for the current vacancy. Entry of a start date causes the software to automatically schedule and assign to staff each of the remaining sixty or more tasks, as well as meetings and general deadlines. Changes specific to the current vacancy are easily made, and the completed schedule is filed in Imara and attached to an e-mail message sent to each staff member. Changes in the schedule, which are always necessary at least a couple of times in the process, are just as easily accomplished.

In the future, a workflow capability planned to be added to Imara may make the scheduling process even more effective. In addition to staff having a list of all tasks assigned, workflow would enable a message to automatically appear on the staff person's computer reminding him or her that it was time to start work on a particular task. Workflow also would automatically provide the staff member with the electronic documents or forms necessary to accomplish the task. The director would be notified by the workflow software if a task was not completed on time.

**b. Requests for Information** — Many of the selection tasks involve asking someone outside the Council for information about the applicants. This includes requests

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<sup>14</sup> **Selection Tasks:**

Announce vacancy; notify Bar members; distribute applications, advise applicants; receive applications; scan and file applications; mail Bar survey; mail credit and criminal reference letters; mail reference letters; request applicant files from Bar Association; evaluate writing samples; mail press releases; analyze and report on Bar survey results; prepare applicant worksheets (summarizing education and experience, credit, criminal records, Bar and/or judicial discipline, references, writing ability, community activities, survey scores and comments); arrange meeting for interviews; notify applicants; interview applicants; discuss qualifications; vote; notify governor of nominations; notify applicants; mail press release; file all materials.

for references, credit reports, confidential Bar Association files, employment verification, attorney survey and many other items. Several years ago many of these letters were redone with each vacancy. The Council's executive secretary has since compiled the WordPerfect documents as forms on her computer. These forms currently also are available to other staff in Imara. These steps have saved substantial time.

As discussed above, workflow may bring these forms to the attention of the appropriate staff person at the appropriate time in the near future. Second, staff may be able to create macros, (perhaps tied to the workflow software) that automatically update a form for a particular vacancy, for example by inserting the names, addresses and social security numbers of current applicants into a request for a credit report. Third, the fax-out capability of Imara could send the request out without mailing or ever creating a paper document in many cases.

**c. Receiving Information** — Now, as in the past, responses to Council requests for information on applicants arrive on paper. They could come in two other forms.

Some documents, such as judicial applications, could be submitted as WordPerfect data files on floppy disks. Theoretically, the application would take up about one-tenth the file space on Imara. Staff could use information from the applications (such as names and addresses of references) without retyping. This process was used twice, then discontinued, at least for now. Applicants showed too much ingenuity in formatting the file, for example, by using tiny print to fit more of an answer into a small space. Further, staff were not ready to directly use the electronic information in the data application. However, requiring certain information to be sent on disk (or by modem) remains a future possibility.

Second, persons providing information could fax it using the fax-in capability of Imara to store the electronic document. This could speed responses by avoiding use of the mail, and save a small amount of time by avoiding scanning the document. This process will be added as soon as practical.

**d. Synthesizing and Analyzing Information** — Once information on the applicants has been gathered it must be analyzed and put in an easily reviewable format for Council members. This involves such tasks as preparing a memo rating applicants' writing samples; copying information such as Bar survey scores and years of legal practice to a summary sheet on each applicant; preparing a memo comparing Bar survey

scores on the current application with previous survey scores; reviewing prior application materials for inconsistencies; and summarizing Bar disciplinary complaints and credit reports.

Imara should help significantly with these tasks now that it can retrieve a document in a few seconds. This is particularly true when documents must be reviewed in several folders, several staff members need to work on a task simultaneously, or the paper filing system simply does not provide adequate access. However, as discussed above, paper files will continue to be useful in some circumstances.

The broad long-term goal for imaging technology and other innovations is to minimize the effort spent on lower-level repetitive tasks so that staff can concentrate on the professional analysis of applicant materials that is the core responsibility. Imaging makes the information needed for decisions readily available, and technology such as project management software and macros minimize repetitive tasks.

#### **14. To Provide Assistance to Others**

One of the Council's principal selling points in seeking funding from the State Justice Institute was providing assistance to others considering relatively small scale imaging products. While not as many court systems have requested help as were anticipated, the goal of assisting others has been satisfied.

The Council's first imaging report, "Managing Documents with Imaging Technology - A Review of Imaging Software and Hardware Evaluated by the Alaska Judicial Council, April 1993," gave a detailed explanation of the capabilities available in smaller scale imaging software, described about twenty imaging software products, and included a discussion of peripheral imaging software and hardware products.

The first report was distributed to about 110 requesting agencies and companies in thirty-one states, in addition to Canada, England, Italy and Singapore. The report was briefly summarized in the National Center for State Court's (NCSC) "Technology Review" publication and the full report was made available on NCSC's electronic bulletin board. Further, the Council's director was asked to make a presentation at the national AIIM imaging convention in June, 1993. An article on his presentation subsequently appeared in the national publication "Government Technology."

About forty persons who reviewed the Council's first imaging report responded to a brief survey on its usefulness.<sup>15</sup> The response was overwhelmingly positive. The users of the report felt it gave them a very useful overview of small-scale imaging, including the various software and hardware components. The product evaluations were well received, and users specifically appreciated learning which areas to stress in their own evaluations and some of the warnings in the report about implementation and system complexity.

Many of the evaluations requested information on the implementation of the Council's imaging system and more of a discussion of its costs and benefits. Hopefully, the current report addresses those issues satisfactorily. Other requests, such as an in-depth look at OCR, scanners, or a continuation of software reviews of newer imaging products are beyond our capabilities.

The Council worked with two organizations to provide more targeted assistance. First, staff have worked with an executive branch task force in Alaska to coordinate imaging projects and establish basic standards for agencies implementing imaging.

Second, the Council has worked extensively with the Alaska Court of Appeals to develop a small scale imaging program. Currently, the Court has applied for and received federal funding of approximately \$100,000 to install computers, a network and imaging. Council staff have worked with court system staff to draft preliminary specifications for the software and hardware involved in the project. The Council will assist the court system with this project to completion.

## ***B. Goals Only Indirectly Related to Imaging***

### **1. To Use a Local Area Network to Allow Staff to Better Work Together**

The Council installed a local area network (LAN) as part of its imaging project. However, a LAN has benefits apart from imaging. First, a LAN allows devices such as printers to be shared over a network. However, staff already shared a printer through a printer-sharing device even before adding a LAN.

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<sup>15</sup> At least six courts responded to the survey, not counting the Alaska Court of Appeals.



Second, the LAN made it easy to back up files. In practical terms, this has made the difference between backing up files and not backing them up.

Third, the Council's Lan Manager and Windows for Workgroups network software gives users access to files on all office computers to the extent allowed by the LAN administrator. This capability has proved quite useful.

## **2. To Use E-Mail to Allow Staff to Better Communicate**

Staff's ability to communicate via e-mail is another benefit of a LAN. The Microsoft Mail product chosen has proved extremely useful, even though the office is quite small. The e-mail system is used to share thoughts and files on a wide variety of topics.

The e-mail programs in Imara and Lan Manager were significantly less useful. The principal reason is that they do not show whether e-mail has arrived. MS Mail can be configured to leave an icon of a letterbox on the Windows desktop. A letter appears in the letterbox when mail has arrived. A second important capability has been the ability to attach word processing files to the mail message.

## **3. To Use the Imaging Hardware to Improve Office Productivity in Other Areas**

The high resolution 17" monitors and 486 computers purchased for the imaging system also have proved quite useful in running day-to-day word processing and spreadsheet applications. While this equipment may not be necessary to draft letters and do office accounting, it does make these applications run faster and more easily, enhancing staff's productivity.

### **C. Goals Still Pending**

While the formal time for the Council's imaging project is drawing to a close, there are several goals for continued work. The most obvious is completing the back file conversion of judicial retention files. Other pending goals are discussed below.

### **1. To Add an Optical Disk Jukebox**

When the Council originally installed its imaging system, it purchased a single disk optical drive which uses disks with an approximate 500 MB storage capacity on each side of a disk. The single platter drive was chosen over one that held multiple disks (a jukebox) in order to keep the initial costs of the system down, and to allow a very fast developing technology to progress. An upgrade to about a ten-disk jukebox within the next year appears feasible.

A jukebox will keep all disks in the drive at the same time, significantly increasing response time in some cases. (Five disks currently are filled.) Often-used documents will still reside on the server's hard drive for ready access, although this would be less important with a multi-disk drive.

### **2. To Add Optical Character Recognition and Full Text Search Capability**

The Council decided early in its project not to emphasize optical character recognition (OCR) with a full text search ability. The primary reason was that it simply did not need this capability to find judicial selection and retention documents. Knowing the document name, the name of the applicant (or judge), the name of the judicial vacancy (or retention year), and, if the document is received from, or sent, out of the office, by whom it was sent to or received from can locate the documents 99.9% of the time. A secondary reason for not emphasizing OCR was limitations in the technology<sup>16</sup> and the fact that the imaging software purchased did not have this capability.

However, OCR with a full text search capability would be useful in finding documents in the reading files, simply because the only indexing of these files is by month and year. Further, OCR technology is improving and Imara may add this capability in its next release.

### **3. To Use the Fax-In Capability of Imara**

The next experiment may be with using the fax-in capability of Imara during the next year. As discussed above, the Council receives dozens of responses from its requests for information on judicial applicants (references, credit reports, etc.) At least theoretically, response time, as well as scanning time would be substantially improved,

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<sup>16</sup> "Managing Documents with Imaging Technology," *supra* note 1, at pp. 7 - 8.

by encouraging respondents to send materials to the special fax number used by the imaging system.

#### **4. To Experiment with Workflow**

Imara is likely to eventually add a workflow capability along the lines now used by KeyFile. As discussed above, the Council would like to experiment with that capability to further automate its selection and retention processes.

Staff envision a system in which a staff person would turn on the computer in the morning and find, for example, a reminder to begin memos on the credit ratings of judicial applicants. Accompanying the reminder might be a form credit memo, the credit reports of the applicants, and any credit memos that the Council had completed for these applicants for prior applications.

#### **5. To Create a Selection and Retention Database**

Imara can keep information about folders of documents, as well as indexing documents. Since the Council organizes its selection documents into folders based on the applicants' names, this feature can be used to create a database of applicant information. The same goal applies to judges in the retention area.

This database might be useful in three ways. First, if applicant information was gathered in one place, users could many times look only there for information rather than in multiple documents. After all, the usual reason that documents must be retrieved is to get information from the documents.

Second, it is at least theoretically possible that information once in the database could be automatically transferred by macros to relevant documents as needed. Thus, much of the Council's summary sheet on each applicant might be automatically filled out.

Third, the database permits statistical analysis of applicant information that can help improve the selection process. For example, what parts of the Bar survey for judicial applicants best predict judicial performance; how do prosecutors rate public defender applicants over time, and vice-versa; how important are years or type of applicant experience in later retention surveys; and how closely do attorney surveys correlate with peace officer surveys.

## **6. To Create a Table/Chart Research Cabinet**

One of the Council's principal duties is to conduct research into the administration of justice in Alaska. In these research projects staff has either created or reviewed hundreds of tables and charts containing information about the justice system in Alaska. Frequently, a report requires review of bits and pieces of this information. Unfortunately the bits and pieces are extremely difficult to find, given the mass of information reviewed and the fact that staff often do not remember the name of the document containing a particular chart or table.

A "cabinet drawer" in Imara could help solve this problem. Charts and tables can be saved and indexed as individual documents (instead of as an unindexed page of some larger documents). The charts and tables will then be organized into electronic folders based on subject areas. The folders will be grouped as an Imara cabinet drawer. This structure will take considerable effort to set up, but will yield significant benefits.



## IV. Conclusions and Recommendations

On the whole, the Judicial Council's document management imaging project has been extremely worthwhile. The effort required to understand the technology, evaluate (and even identify) imaging software, and implement a system has been tremendous. But as discussed in this report, staff now have better access to the information needed to carry out the Council's principal tasks.

Much of the benefit of the imaging project has not been directly related to imaging, but rather has been incidental to the process of implementing the system. Staff can retrieve documents faster and the Council saves on filing space, but these factors might not justify the system in themselves. Significant benefits have come from the process of reviewing judicial selection and retention evaluation tasks, as well as seeing what documents exist and how they can be best organized. Further, related technologies such as networking and e-mail have yielded significant benefits.

The Council recommends that organizations considering document management imaging technology consider the following steps:

### Preparation

1. The first step is to acquire a basic understanding of imaging technology. This is critical to evaluating imaging products and to evaluate how these imaging products might impact organization and work processes. The step is critical even if an imaging consultant is hired to assist in the project.

This report and its predecessor help to acquire this basic understanding of imaging. In addition to reviewing these reports, join the Association for Information and

Image Management (AIIM), review publications from the AIIM bookstore, and if possible attend an AIIM imaging conference.<sup>17</sup>

2. The second step is to review your organization's work processes and how imaging technology could benefit your goals. What are these work processes? What documents do you keep and how do you organize them? Does your organization have paper-intensive or repetitive work that might benefit from imaging? What components of imaging, such as workflow, OCR or fax capability, would be useful? How will an imaging system be paid for?

### **Evaluation and Purchase**

3. After gaining a basic understanding of imaging technology, and completing a detailed review of your organization's needs, an organization can begin the third step of evaluating specific imaging software products. Start by evaluating as many products as possible to get a feel for the range of options. Try to evaluate as many as possible in your offices, as well as at trade shows or vendor offices. Consider how well the software fulfills your needs. One factor relevant to all users is how easy a product is to use.

The most important advice for evaluating imaging software and indeed the entire process is to talk to current users of the leading systems. No matter how thoroughly you try a product, imaging is complex enough so that you will only really have a full understanding of the pluses and minuses of a product after you have purchased it and used it for several months. Talking to several current users before purchasing the product minimizes the risk of unpleasant surprises.

4. The fourth step is to evaluate and purchase compatible hardware and associated software after deciding on imaging software. By doing this the user maximizes the chances that the many complex parts of an imaging system will work together.

5. One possible source of assistance in the preparatory and evaluation phases of acquiring an imaging system is a consultant. The Council did not hire an imaging consultant and thus cannot be of much help. However, the executive branch in Alaska did request proposals and hire a consultant to evaluate the imaging needs of fifteen to twenty departments. By this process, each department hopes to receive assistance at a

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<sup>17</sup> See note 5, *supra*.

reasonable price that will enable them to implement imaging in a consistent, coordinated manner.

### **Implementation**

6. Whatever other outside assistance your organization pays for, the Council recommends that the imaging software company or value-added reseller be hired to help with installation of the imaging system. This process is complex enough so that this expense is justified even if you have to pay for travel from out-of-town as the Council did.

Note that someone who installed your system is the ideal person to later provide technical support. Access to continuing support is critical. Many products charge extra for it. Telephonic support sufficed for the Council, but only because one employee is an expert in diagnosing and fixing general computer problems. Otherwise, on-site support would be necessary.

7. The next step on which to focus is training about the imaging system and computers in general, for users, and for system administrators. However, organizations should begin this step with the first step discussed above. Future users of the system should be involved in the basic evaluation of imaging technology and your organization's needs, as well as specific product evaluations.

Imaging software is not especially complex from the user's perspective. However, it is absolutely necessary for users to be comfortable with the software and familiar with the documents kept on the system. Even the best imaging system is not worthwhile if it is not used.

Training for system administrators (at least two so that the project is not dependent on one person) is more difficult. Clearly, these people need to be involved in every stage of the process. It is especially important that they work with the person installing the software and hardware so that they understand every aspect of that process.

While not directly related to imaging, it bears emphasizing that thorough training is important in the use of any office computer technology. An ongoing training program in word processing and other software used in the office, as well as basic knowledge



about how computers work and how to keep them running will pay off many times over.

8. The final step is to emphasize reevaluating work processes rather than narrowly focusing on imaging. As with training, the focus on this step should be from the start. As emphasized throughout this report, the most significant benefits of an imaging project in many ways come from the process of evaluating the way your organization accomplishes its major goals.

The Council's independent evaluator concluded his report by stating:

[The] real increases in productivity [from the imaging project] lie primarily in the less tangible areas of worker motivation, self-confidence, and problem-solving skills than in either time or cost comparisons with prior conditions. The imaging system project in the AJC office is perhaps best seen as an episode in the office's continuing growth in both individual and collective job skills.

Others interested in imaging technology can derive a significant benefit from it also, as long as they focus on these broad goals.

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# ***Appendix A***

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**External Evaluation of a New Document Imaging  
System at the Alaska Judicial Council**

Prepared by:

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June 30, 1993

## **Introduction**

Bill Cotton, the Executive Director of the Alaska Judicial Council (AJC), asked me to spend a total of three days to help develop a plan to evaluate the staffs' experience with a new document imaging system, to conduct interviews with staff, and to summarize my findings. A previous report prepared by Bill Cotton describes the imaging system in detail. Teri Carns on the AJC staff is conducting an internal evaluation which will both describe in detail use of the system, and will introduce time and cost comparisons with the existing manual filing system.

I decided to base my own evaluation on interviews with each member of the AJC staff. I interviewed six staff members individually on June 16, 1993. I did not interview the temporary secretary. A copy of the interview guide I used is attached.

## **Evaluation Context**

The effects of the installation of the document imaging system at the AJC are best understood in the context of the functions and operations of the AJC itself. The office is small; staff frequently interact in the course of moving about the office. The AJC largely works on a project basis. Staff work on various aspects of the same project (e.g. a research project or an evaluation of applicants to a court position). They are adapted to changes in work flows and job content and have worked as a team for some three years. In this context, the installation of the imaging system constituted another project.

AJC projects normally fall into two categories: preparation of recommendations for selection and retention of judges, and special studies. Both categories of projects often refer to information produced in previous projects. In the case of selection and retention, the data are frequently contained as the primary subject in hundreds of short documents (e.g. letters of reference, memos evaluating writing samples). In the case of special studies, different types of information are frequently contained in numerous tables within several dozen large reports.

Normally, staff other than the Executive Director are responsible for the day-to-day operation of an AJC project. In the case of the document imaging system, the Executive Director has taken the lead in designing and implementing the project. A member of the staff who normally directs projects has taken the lead on the internal evaluation of this project.

AJC staff have been using personal computers for word processing, data analysis, and accounting for many years. They have shared printers on a crude network. They are therefore generally familiar with the idea of electronically stored files and the DOS operating system. The staff has also been working over the last several years to develop standards for formatting written products. As a result, they entered the imaging project with a history of working together to come up with common procedures.

## **Material Changes in the Office Environment**

While each member of the AJC staff possessed and used a personal computer before the imaging system was installed, the system itself required software and hardware upgrades which fundamentally changed the office environment. Most staff now operate in a windows environment and use more powerful word processing and spreadsheet software. They have larger screens enabling them to view more than one document simultaneously. Most have new 486 computers. They are now linked by electronic mail that includes the capability of forwarding each other documents with comments and/or instructions.

The imaging software itself appears as one of the options available in the windows environment. A scanning device centrally located in the office is the only other specialized element of the imaging system immediately evident to the user.

## **Transitional Changes**

The office is still in a transitional stage of implementing the imaging system. The primary assignment for one staff member continues to be that of scanning in historical documents. She estimates that, once she enters all past documents, scanning current documents will take about an hour a day on an ongoing basis. The staff generally think that it currently takes too long to view documents in the imaging system. There is therefore an incentive to limit use of the system. New equipment may significantly reduce

these delays.

The Executive Director has also encouraged staff to spend time using the system and learning about computer technology. This time allocation will probably change as other projects start.

### **Changes in Job Difficulty**

I asked each staff member whether, for any reason, their job has become more or less difficult over the last year. We then discussed the specific elements of their job that changed. My interest was not only in understanding the direct effects of the imaging system on people's jobs but also how the system may have interacted with other factors to indirectly affect work in the office.

None of the AJC feel that their job now is more difficult overall than it was one year ago (before the imaging system was installed). Most think that while the content of their job has changed (as it often does from year to year), it is just about as easy (or difficult) as it was a year previously. Among the ways in which one or more staff report that individual aspects of their job have become more difficult are:

- o Duplicate filing of materials (manually and electronically) takes more time and thought.
- o Decreased productivity when the computer network is down or when the imaging software is unavailable (it is limited to 3 users at a time).
- o For some, the subject of computer imaging systems is less engaging than other AJC studies.

- o Frustrations with getting all the components of the imaging system to work together.
- o Getting reports too late to do everything that should be done to see that they are in correct final form.

Staff also mentioned ways in which their job has become easier:

- o Gains in efficiency that come with experience.
- o Using the imaging system to access data on judicial applicants that is often incomplete or inconsistently filed in the hard copy file.
- o Use of existing Word Perfect documents as a starting point for new documents.
- o Development and use of spreadsheet files to generate financial documents.
- o Use of Word Perfect to generate labels for manual retention and selection files.
- o Ability to rely on the temporary secretary.

Not surprisingly, there appear to be a variety of reasons why individual aspects of AJC jobs have become more or less difficult. The imaging system itself appears to have directly increased, at least during the transition period, the time most staff spend on filing tasks. It has also apparently increased the time people spend waiting to take the next step in their work. While these delays are often measured in seconds, staff view them as a nuisance and a lack of control over the pace of work. There is hope that changes in the system will reduce these delays, but some staff still expect that the slowness of the



system will continue to be disincentive to its use.

At the same time, the system has already shown itself to be useful in at least one element of the selection/retention process. It appears that the imaging system will be more efficient than the manual filing system in retrieving information that is identifiable in discrete documents that are themselves filed in different locations in the file system. Substantially reduced system response times could make the system more attractive to staff for more document retrieval tasks.

The imaging system has indirectly contributed to establishing an environment that has allowed people to make their jobs more efficient. The windows environment coupled with Word Perfect and increasing staff experience has led several staff to reduce redundant tasks. Another staff member was able to invest her time in the development of linked spreadsheets in Excell to greatly reduce the time it takes to produce financial accounting summaries.

Growing staff competencies and capabilities to produce documents themselves has also had the unintended consequence of more closely equating report due dates with the date at which the report first reaches the staff member responsible for ensuring that the report meets office standards. This is clearly not a direct outcome of the imaging system; however, it is part of the evolution of a computer-literate office.

The imaging system as currently implemented probably has not improved the ability of the staff to retrieve the type of data relevant to special studies (as opposed to

selection and retention projects). This is because the system is structured to index documents but not tables within documents. If the staff wants to find a comparison of the age and gender of different types of offenders, for example, they cannot ask the system to search for such data. The manual filing system does not support this type of search capability either. Staff hope that it will be possible to address this problem by creating a "file drawer" in the imaging system into which charts, tables, and similar items can be entered and indexed. If these electronic images were indexed individually, they might prove to be easier to access than by using the hard copy reports.

### **Staff Assessments**

I asked each staff member the following question:

*Knowing what you know today, if you were in charge of making the decision of spending government money to put the imaging system in this office, what would you do?*

Below I have tried to quote, or at least closely paraphrase, each of their answers:

- o I think I would have done it. Everyone has learned so much. The experience of having done it is the most valuable part.
- o For the money, and with the changes they have suggested, it's ok.
- o I definitely would have done it. I was excited about the idea. It has been comparatively easy. It has been kind of fun.
- o I would certainly go through with constructing a database. The network, the email, and the fax are useful and timesaving.

I don't know enough about the cost of different systems to know whether it makes more sense to institute these capabilities by themselves or as part of an imaging system.

- o If I were not looking forward to using the database, I probably wouldn't install it. The system is too slow in retrieving files and I'm not sure it will get all that much better. But using the database to find all reference letters that one person wrote, that may prove to be a real advantage of the imaging system.
- o I would do it. If you looked at the amount of time we are spending to research, install, and implement the system it certainly hasn't resulted in a net time savings so far. But we are making an investment in the future which will position us to better handle budget reductions. The network part has made it easier to exchange documents and reduced the paper flow; the word processor is more efficient; we now are much more familiar with our filing system and have had to think about how to organize our material. It has encouraged us to look for more efficient ways of doing this, whether or not they actually involve the imaging system itself.

## **Conclusion**

I have not reviewed the literature evaluating changes in productivity associated with the surge in office computer use. This case suggests, however, that real increases in productivity lie primarily in the less tangible areas of worker motivation, self-confidence, and problem-solving skills than in either time or cost comparisons with prior conditions. The imaging system project in the AJC office is perhaps best seen as an episode in the office's continuing growth in both individual and collective job skills.

Another type of imaging system could have had the opposite effect. Suppose they had purchased a more centralized system that required a specially trained operator. Suppose further that staff interacted only indirectly with the system through requests to the operator for data. Office staff would have realized little of the learning and virtually none of the ancillary gains in personal computing power. By contrast to this hypothetical case, then, the type of system chosen is clearly superior.