FROM WORKFLOW MANAGEMENT TO B2B
1. WORKFLOW MANAGEMENT

1.1 INTRODUCTION

Imaging systems, which are costly to implement, must provide direct and strategic benefits to justify their implementation. The real pay-off from using imaging systems lies in their application, along with other technologies, to streamline the business processes and workflow.

Though there is general agreement that the automation of workflow is a key ingredient of any process re-engineering effort, there is no clear definition of workflow automation. Most of the imaging vendors offer some level of workflow automation software. Since basic imaging software (scan, store, retrieve, display and print) offerings are similar, the focus of many vendors is to use add on facilities to differentiate themselves from the other vendors. The examples of additional capabilities are OCR, bar code, intelligent character reading (ICR), automated indexing, communication to mainframe applications and workflow. The workflow differentiation is probably the most important of these additional capabilities. For example, FileNet Corporation, an early advocate of workflow, has very effectively marketed their "workflo" product as a distinct advantage over their competitors. The lack of clear understanding of what constitutes workflow automation has made it difficult for users to evaluate workflow products. This problem is further compounded by two key issues:

1) Though workflow automation can be implemented without imaging systems, the use of imaging systems will have limited pay-off without the workflow automation software. It is because of this that the proponents of imaging systems (vendors and consultants) have been pushing the use of workflow software as a part of the imaging systems.

2) Since there is no clear definition of workflow automation, it is difficult to distinguish between workflow and process redesign. Any business activity involving more than one individual involves workflow. Therefore, no process redesign effort can exclude review of workflow. On the other hand, the proponents of workflow automation may propose that no workflow automation should exclude process redesign.

This paper will assist in understanding key issues involved in understanding workflow management, and evaluating and selecting workflow automation software. Specifically this manual will help to:

- Understand what workflow management is and how it works
- Select an application for workflow
- Conduct workflow analysis
- Establish workflow automation requirements
- Evaluate and select workflow software
- Better understand current workflow software products
• Understand future trends in workflow automation

We have placed significant emphasis on workflow analysis and process redesign in this manual for several reasons,

First, workflow brings to the office disciplines similar to those computer integrated manufacturing (CIM) brought to the shop floor in the manufacturing industry. If we were to treat paper-based information in the office as a product and apply workflow technology for efficient movement and processing, we should be able to achieve similar productivity gains to those CIM brought to the manufacturing industry.

Second, workflow software can be used in the office for many applications for which imaging happens to be one of the first. In this manual, workflow software is described from an imaging perspective because the imaging vendors (later joined by systems integrators) have been early proponents of workflow software and have done an excellent job of marketing and implementing workflow software. To achieve the full benefits of workflow software, organizations must first analyze and significantly redesign their business processes (process re-engineering) before applying the workflow software.

Hence, workflow analysis and process redesign are considered important components of using workflow software and are included in this paper.
1.2 WHAT IS WORKFLOW MANAGEMENT

There is no clear definition of workflow management in the market place today. Some define workflow as routing of documents and others define it as routing and processing of documents. The word workflow by itself is a meaningless term because the real issue is work management. Workflow management is a more meaningful name because it at least conveys something, management of work as it flows through the organization. In this paper the terms workflow or workflow management are interchangeably used. The purpose of this section is to provide a more complete definition of workflow and describe its components and characteristics. The following topics will be addressed in this section;

- Workflow Definition
- Workflow Components
- How Does Workflow Software Work?
- Importance of Workflow to Image Management Systems (IMS)
- Workflow Evolution

Workflow Definition

Workflow or work: management is the movement of all objects (data, documents, electronic forms, text, voice, etc.), and processing and monitoring activities carried out on these objects during each step of the life cycle of the process to perform a value added function. **Workflow automation** is automatic capturing, routing, processing and management of these objects to perform a value added function at a minimum cost. We believe that in the near future, the term workflow automation will be replaced with business process automation. The business process involving more than one individual involves workflow and such process cannot be automated without workflow automation. The workflow software makes automation of workflow possible. The automation of workflow can be implemented at several levels. At the basic level, workflow software performs the routing function similar to an electronic mail system. The objects are forwarded to various users for processing and the last user completes the work and closes the task sequence. However, the complexity of business operations require more sophisticated workflow software with advanced work management functions. These functions include integration with mainframe-based applications, accessing desk top applications (word processing, spreadsheets, forms, etc.), work queue management, work balancing, work distribution, procedure management, and work monitoring and status reporting.

Workflow Components

The Workflow software may encompass many functions and components- However a typical workflow system has the following components: (Figure 1)

- Routing
- Queuing
- Reprieving
• Processing
• Administrative Controls
• Development Utilities

Routing

The workflow process begins when a transaction is entered in the workflow system to initiate a process. For example, in the case of an imaging system, the workflow process begins when documents are scanned into electronic images. Once the transaction has entered the workflow, the software's routing rules take over to control the distribution of the documents from participant to participant. [Participant is an entity which contributes to a process. Participant can be a person, a computer application or a device.] The routing activity provides several options:

• Automated routing based on predefined algorithms
• Manual routing to participants
• Automatic routing based on conditional logic
• Exceptional routing based on routing rules which consider single or multiple information criteria. For example, routing can differ based on amount on an invoice. Routing may take place only after a number of tasks have taken place.
• Parallel routing allows the object to be routed to more than one destination at the same time.

The routing component may contain very sophisticated rules to consider such items as date, amounts involved, type of document, date of document, etc.

Queuing

The queue management component of the workflow software manages the following activities:

• Work Prioritization
  The routed work is prioritized according to the priorities established in the system. For example, in an insurance company, a request for increasing the insurance amount from an existing customer may have a higher priority than a new customer's request for an application form. The priority rule, for example, may be a first in first out (FIFO) concept for processing the work in the queue, or the processing priority may be based on a type of a customer.

• Workload Balancing
  Workload balancing is required to maintain an acceptable level of output from the work group. Workload balancing may involve logical grouping of transactions,

• Work Aging
  Work aging indicates how long the work has been sitting in the queue waiting to be worked on,
• **Work Status**
  Work status indicates the work backlog in the queue, queue date, job information (Job name, job number etc.).

• **Queue control**
  This allows for suspending or reassigning a queue.

**Retrieving**

This component organizes the retrieval of documents from storage or other sources including an automated application from the mainframe. The purpose of the retrieval component is to:

• **Retrieve information at the level required to perform the process**
  For example, if a task requires retrieving a folder instead of a document, only the folder is retrieved. Documents from multiple folders may be retrieved,

• **Retrieve information in a most efficient manner**
  The retrieval process may allow prefetching of documents, if desired.

**Processing**

The processing component (coordinating) is the nerve center of all the workflow components because it ties together the working of all the components as an integrated process. The processing components allow:

• Integration to data processing systems at screen, program or data levels.
• Integration with other facilities such as an imaging system. E-mail, tot systems, spreadsheets, and Word Processing-
• Accessing documents from different sources, combining them with a letter and mailing them or FAXing them.

**Administrative Controls**

The administrative controls allow the supervisors to monitor performance, identify problems before they become bottlenecks and analyze productivity. For example, use of an ad-hoc report writer could be used to display information on the screen or produce hard copy reports. Reports may reflect all records in a file, or a portion of it. For example, supervisors can obtain backlog reports to review work remaining in the in-basket. Reports on employee productivity indicating total items processed, total number of days to process and average number of days spent to process an item can be easily obtained and appropriate action taken. Inquiry ability allows the user to view the contents of documents and folders at any time.

Another purpose of the administrative controls is to provide ability for housekeeping tasks such as security. Security rules can be established to limit access by time, function, job category, person or in many other ways.
Development Utilities

The workflow utilities allow the user to develop workflow procedures, integrate applications with one another and maintain the workflow system. Development kits provide the tools for developing workflow applications, creating forms, menus, input screens, developing interfaces (e.g., DDE) to other applications, etc. The language used for developing the workflow should be either script or icon based to allow user to quickly change the workflow to meet changing business needs. The specific features are:

- To help in interfacing with other systems, a workflow software includes development tool kits to handle program-level access to the vendor's imaging product, debugging tools, support for language interfaces, defining new document representations or accessing other platforms.
- Application templates (application templates contain processing codes for certain application functions such as claims processing) will be desirable in some cases to expedite the application development process.

How Does Workflow Software Work

Workflow software provides the capability to electronically move work between and within processes according to user-defined procedures. Work may consist of document images, data, text, voice, etc. Workflow software in general does not do any "processing" by itself, it coordinates, controls and monitors the movement of objects between users. The "processing" is done by scripts or programs written for the applications. Workflow software helps to minimize the effort required to implement new procedures or change the existing procedures due to changes in business needs. The best way to illustrate the working of an image-based workflow system is by an example. Table 1 indicates the workflow under three different environments for processing new applications for an insurance company:

1) Current Procedures without Workflow / Imaging
2) Procedures with Workflow / Imaging
3) Procedures with Workflow / Imaging after Process Redesign

The following observations are made regarding the operating environments 2 and 3 recorded in Table 1:

- **Procedures with Workflow / Imaging**
  - The manual handling of documents was either reduced or eliminated altogether,
  - Some processes (for example Step # 4, mail sorting and folder preparation) were eliminated. Some other processes were scheduled to take place in parallel to utilize routing capabilities of the workflow software. Many manual processes were automated,
  - Productivity information was made available to the management sooner,
  - Customer inquiries were handled much faster,
• Procedures with Workflow / Imaging After Process Redesign
Under this environment, the processes were radically redesigned including organization changes, changes in operating procedures and policies, and retraining of personnel. The objective was to achieve dramatic improvements in the processing of insurance applications and customer service, the characteristics of the resulting system:

- Fewer processes were retained.
- Fewer personnel were involved in the process (for example, the positions of data entry clerk and assistant underwriter were eliminated),
- The entire application process was turned into a self-contained process by having the Case Manager handle the process from beginning to the end.
- The work status monitoring system was simplified. The need for active supervision was eliminated. The Case Manager was given more authority and empowered.

### Productivity Improvements with Different Environments

<table>
<thead>
<tr>
<th>Productivity Criteria</th>
<th>With Workflow / Imaging After Process Redesign</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application Processing Elapsed Time</td>
<td>Reduced by 20 Percent</td>
</tr>
<tr>
<td>Processing Time</td>
<td>Reduced by 20 percent</td>
</tr>
<tr>
<td>Personnel</td>
<td>Reduced by 10 percent</td>
</tr>
<tr>
<td>Customer Inquiry Time</td>
<td>1) 50 Percent Improvement</td>
</tr>
<tr>
<td></td>
<td>2) 60 Percent Inquiries Handled in One Call</td>
</tr>
<tr>
<td>Customer Complaints</td>
<td>Reduced by 20 Percent</td>
</tr>
<tr>
<td></td>
<td>Reduced by 75 Percent</td>
</tr>
</tbody>
</table>
2. BUSINESS-TO-BUSINESS STRATEGIES