

**OFFICE OF THE CITY MANAGER
DES MOINES, IOWA**

**CITY COUNCIL COMMUNICATION 97-479
SEPTEMBER 22, 1997 AGENDA**

SUBJECT:	TYPE:	SUBMITTED BY:
SELECTION OF FILE/MANAGEMENT SOFTWARE FOR YEAR 2000 CONVERSION PROJECT	◆ RESOLUTION ORDINANCE RECEIVE/FILE	KEVIN RIPER FINANCE DIRECTOR/TREASURER JACK RICH DATA PROCESSING ADMINISTRATOR

SYNOPSIS —

File/management software is needed to speed the rate of conversion of existing City software applications to year 2000 compliance.

FISCAL IMPACT —

The total cost of the recommended software package is \$32,130. Funds for this purchase were appropriated in Index Code 111062 (Finance Department/Data Processing Division), shown on page 242 of the 1997-98 Operating Budget document.

RECOMMENDATION —

Acquisition of File-Aid Software for the Year 2000 Conversion Project.

BACKGROUND —

The much-publicized year 2000 problem in information technology stems from an industry decision decades ago to store in computers the "year" part of a date with just two digits instead of four; e.g., "97" instead of "1997." This space-saving assumption proved acceptable until the turn of the century, at which time computer programs will be unable to determine if a year of "00" means "1900" or "2000."

In July 1994, the Data Processing Division of the Finance Department began to revamp the programming language code for the City's 57 mainframe-based software applications to achieve "year 2000 compliance." The applications that needed to be converted consist of 1,613 modules (discrete sections of programming language code) with 1,295,357 lines of code.

Through the summer of 1997, the Data Processing Division's programming staff converted 31 of the 57 software applications, representing nearly 700,000 lines of code. Having already used more than 60 percent of the original time allotted to the project (63 months—from July 1994 through September 1999), the Division must step up the pace in order to finish converting the remaining 26 projects by the original target date of October 1, 1999. (See Attachment 1 for various measures of progress to date.)

The industry standard for computer programmer productivity in converting the City's programming language (COBOL) is 56 lines of code per hour. (See Attachment 2 for details of the industry standard.) During the first three years of the project, Division programmers have been averaging well in excess of that standard: 130 lines of code per hour. But there are not enough programmer hours available to

devote exclusively to year 2000 conversion. Thus, individual programmer productivity must be increased even further.

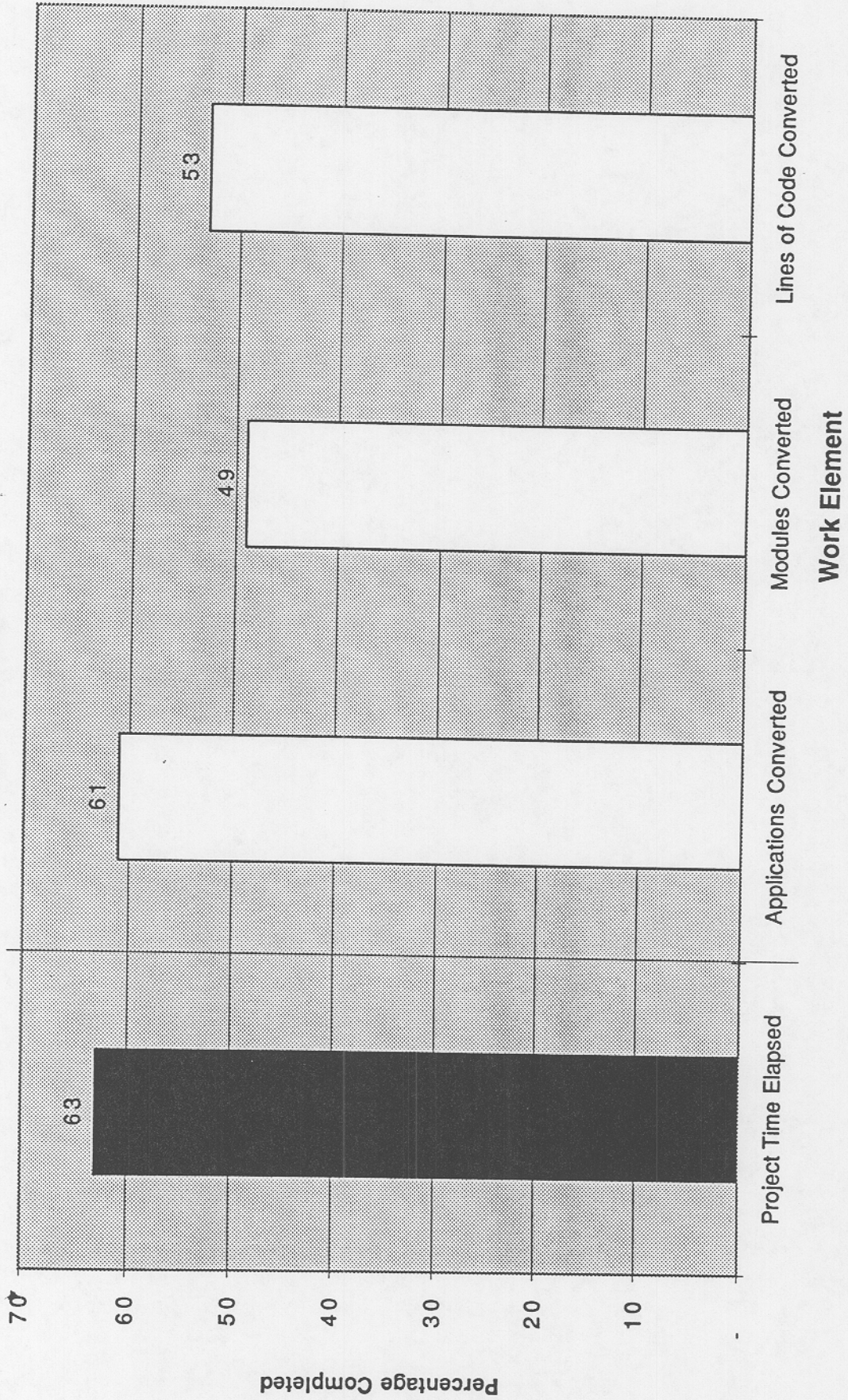
The software package proposed for purchase—File-Aid—is an interactive software product that increases data processing productivity in both program development and daily file and record maintenance. File-Aid is designed for system, application, operations, and all other Data Processing personnel. Unlike most software available, File-Aid is not limited to year 2000 conversion only. The objective is to have a user-friendly and versatile tool for current use as well as far into the future. It allows programmers to search through existing COBOL code much faster than the current method of scrolling through screens or poring over hard copy printouts of various computer programs. It also provides the ability to create and convert existing data in files. This is an on-line function and eliminates the need to write some additional programs. Also, it will do away with the current limitation of not being able to edit files greater than 256 characters in length. File-Aid allows faster, easier on-line checking of contents of data fields in records. It also provides for display of all fields or selected fields.

Staff estimates that using File-Aid would allow programmers to convert nearly 200 lines of code per hour. At that rate, the rest of the software applications are expected to be successfully converted to year 2000 compliance within the two years remaining on the project timeline.

Attachments

YEAR 2000 CONVERSION PROJECT

Progress to Date



Cost and Labor Estimation: Repairing Line of Code Method¹

1. Collect Inventory.
2. Subtract 20% for comments.
3. Multiply by \$1.10 for cost.
4. Divide by 100,000 for labor years.

100,000 lines of code per year per programmer
divided by
(2,087 hours per year per programmer
times .85 productive hours ratio)
equals
56 lines of code per hour

Example: 5 Million Lines of Code (LOC) - 20% = 4 Million executable LOC
 4 Million Estimated LOC * \$1.10 = \$4.4 Million Estimated Costs
 4 Million/100,000 = 40 Full-Time Employees

Assumptions:

- Mainframe-based COBOL code
- Average complexity, change infrastructure
- \$60/hour labor rate
- Tool use excluded; tool use will decrease cost
- Logic solution assumed; known data expansion is up to 50% more (\$1.65/ELOC)
- Fully loaded project to fix software; MIPS/DASD excluded

- Ranges observed from \$0.60 to over \$3.50 per ELOC
- Labor rates rising, but so is efficiency

- Worldwide Estimates: 250+Billion LOC commercially @\$1.10 + government = \$300 - \$600 billion worldwide

¹ Source: Gartner Group, 1996. Reprinted by permission.