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Automated Word Processing Requirements for the City of Omaha, Nebraska

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AUTOMATED WORD PROCESSING REQUIREMENTS
FOR THE
CITY OF OMAHA

by

Donald F. Norris

Center for Applied Urban Research
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August, 1984

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AUTOMATED WORD PROCESSING REQUIREMENTS
FOR THE
CITY OF OMAHA

Introduction

On April 1, 1984 the Center for Applied Urban Research initiated a study of the requirements for automated word processing for the city of Omaha. The study involved the collection and analysis of information regarding the amount and kind of typing activities in each city department in the civic center. The purpose was to determine whether automated word processing would be feasible and practical in these departments and, if so, how many word processing work stations and printers would be required.

Data collection forms and a questionnaire were distributed to all secretarial/clerical personnel in civic center departments with instructions to complete these forms for a typical one-week period. In addition, CAUR staff personally observed the work of most of the secretarial/clerical employees. The findings and recommendations that follow are based on data from the observations, questionnaires, and survey instruments.

Existing Situation

Preparation of reports, correspondence, standard forms, repetitive letters, and other documents in most city hall depart-

ments is done by secretarial/clerical personnel using electric typewriters. This is true for all departments except for the mayor's office and the personnel department which have two automated word processing work stations each, the city council which has one memory typewriter, the planning and community development department which uses data processing terminals connected to the Douglas County computer system for the issuance of building permits, and the Word Power division of the finance department which uses six memory typewriters.

What is Word Processing?

Automated word processing differs from the preparation of typed material on electric or even memory typewriters in several ways. First, the equipment itself is different. Instead of typewriters, secretarial/clerical personnel use computer-like devices known as word processors or word processing work stations. These look like small (usually 12 inch) television screens with typewriter style keyboards attached, although the keyboards also have numerous additional keys for such things as cursor control, numeric data entry, and special functions. This equipment also includes a printer that is physically separate from but electronically connected to the computer device that powers the system.

Text and data are entered onto the screen and into the system's computer memory and magnetic storage system through the keyboard. Changes can be made to entered material (including

major changes like moving entire paragraphs, inserting and deleting material, changing words throughout, correcting margins, verification of spelling, and much more) before a document is printed and also after an author has made changes in printed material. Only those items in a document that need changing or correction are touched, and the rest of the text is left alone. This is in contrast to use of a typewriter where entire pages may have to be retyped in order to correct one or two words or lines or to make other changes.

Automated word processing is especially useful in situations where second and third drafts of material must be prepared, where repetitive documents (letters, standard forms, and the like) must be typed, where large mailings of standard materials are undertaken, where lengthy reports or other documents are prepared and revised, for general correspondence, and many other purposes. Indeed, there is little for which a typewriter is used that word processing is not well-suited and may be more cost-effective. About the only time word processing may not be cost-effective is if it is implemented solely for the creation of original material that will not be revised and for which additional typed original copies are not required.

In addition to the text editing capability that word processing provides and its usefulness when producing repetitive documents, output productivity improvements of 200 to 400 percent have been reported with the use of word processing.[1] According to one of the most authoritative sources in the industry, Datapro, word processing advantages include:[2]

Increased office efficiency resulting in improved secretarial support for all executives and/or word originators;

Higher quality typed output based upon more advanced equipment;

Higher utilization of installed office machines;

Improved human resource utilization with better control and supervision of secretarial personnel through a word processing center; and

Greater career opportunities for secretaries and clerical personnel.

Also, Datapro says that productivity improvements result from:

Reduced retyping time for error-free hard copy;

Facilitation of document revision/change;

Faster output speeds (from 1-120 pages per minute depending upon the output device);

Reduction in amount of proofreading required;

Leveling of peaks and valleys in an otherwise unpredictable workload when dictation equipment is used; and

Elimination of the retyping step for photocomposition input (when required).

Omaha's Word Processing Requirements

In the next few pages, the requirements for automated word processing for the departments of Omaha city government located in the Omaha-Douglas Civic Center will be presented. These will include a brief summary of the study team's observations and the data collected on typing activity in the departments. Figure 1 in the Appendix summarizes the typing activity in each department

by secretarial/clerical position as reported on the data collection forms.

A low volume of typing reported for any of the departments should not be interpreted as indicating that staff are inactive or unproductive. The principal concern of this study was to identify the need for word processing, so the study team focused almost exclusively on typing activity and did not record or analyze the myriad other jobs done by the personnel observed. Thus, other work, involving such things as answering the telephone, opening and sorting mail, filing, photocopying, undertaking business-related errands for professional staff, proofreading, responding to questions from the public and other employees, and much more, is not reported here.

City Council

The city council's secretarial/clerical staff of two was observed during the weeks of May 7, 14, and 21. A total of 3.5 observation hours occurred. During this period 52 minutes of typing was observed.

Much of the work of these persons involves typing repetitive letters. They also answer the telephone and respond to questions and requests from council members and aides. Council members have expressed the desire for the capability to do large mailings that present equipment cannot handle.

Based on the type of work involved in this office and the relatively high use of the typewriters reported in the survey of typing (14 hours for one position and 18 hours for the second

position in one week) and the large volume of typing (203 and 269 document pages and envelopes, respectively), two word processing work stations and one letter quality printer with a dual sheet feeder and an envelope printer would be optimal for this office. However, should budgetary or other constraints preclude acquisition of the optimal configuration, then one work station and a letter quality printer with a dual sheet feeder would be the minimum for the city council office.

Finance Department

Administrative area. Observation of three secretarial/ clerical positions occurred during the weeks of April 30 and June 4 for a total of four hours, during which 45 minutes of typing was observed. These persons also answered the phone and responded to requests from other staff personnel in the department. During the observation period, these persons were heavily involved in activities surrounding annual budget preparation, and thus the reported and observed typing may somewhat understate the average typing load in this department.

Data from the survey also suggest a relatively limited typing volume for these positions. One reported no typing during the survey week, 9.5 hours of typing for 46 document pages and envelopes were reported for the second position, and 17.5 hours and 67 document pages and envelopes for the third.

Based on available data, the need for a word processing work station for the administrative area of the finance department is

marginal. Should a higher typing volume be documented at a later date, a single work station and letter quality printer could be implemented.

Purchasing division. Very little general typing was reported by or observed in this division. Most of the typing work by the four secretarial/ clerical positions related to standard forms and documents associated with purchasing activities. As has been recommended in a previous report[3], Omaha should implement an automated and fully integrated financial management system including a computerized purchasing module. Such a module would serve substantially to automate the activities of this division.

Presently, the only practicable use for word processing would be in the preparation of bid specifications. However, these may just as efficiently be prepared in the word processing division with proper instructions from the purchasing division.

Because of the low volume of typing in this division, its real need for data processing, and the potential to use word power for bid specification development, no word processing equipment is recommended here.

Word processing division. This division currently is the city's central word processing office. It operates six memory typewriters equipped with floppy disk drives. These systems lack full view display screens for on-screen editing, and when the typewriter is printing the system cannot be used for typing. As a result, these systems do not provide their users with either the capabilities or efficiencies of full word processing systems.

Observation during the weeks of May 9 and 14 plus the returned typing survey sheets documented a high level of typing in this division. For example, the six positions reported from 15 to 28 hours of typing (or data entry) not including time required to print entered materials, and from 93 to 269 document pages and envelopes typed. Also, information provided by the word processing supervisor indicated that the personnel in this division are involved in billable work an average of approximately 75 percent of their time.

The recommendation for this department is for six modern word processing stations for the six staff persons and for two letter quality printers and a draft quality matrix printer. Consideration should be given for using one of the letter quality printers as an envelope printer. The other letter quality printer should be equipped with an automated dual (or multiple) sheet feeder.

The city should give serious consideration to eliminating the $16 per hour charge-back to other departments for the work done by the word processing division. This charge-back provides a powerful disincentive to other departments for use of the capabilities of this division.

As the new word processing equipment is implemented in this division and increased document output productivity occurs, greater capacity for word processing will exist there. Elimination of the charge-back coupled with a city-wide policy regarding use of centralized word processing should ensure that this additional capacity is effectively employed.

This policy should be addressed to department heads and should indicate the types of documents suitable (or required) for production in the word processing division versus those for completion in the departments. One example already cited might be that the purchasing division's bid specifications should be handled by the word processing division. Another might be that any lengthy document that requires retention and periodic revision, such as a plan, ordinance, or the like, should be produced by this division.

Positive assurances also need to be given the staff in this division regarding retention of their jobs. These are dedicated, efficient, long-term employees who are currently quite concerned regarding the direction and outcome of this study.

Human Relations Department

Observations in this department during the week of May 7 as well as data from the typing survey forms indicate a relatively low level of typing activity by the three secretarial/clerical positions. No justification can be found at present to recommend word processing equipment for this department. Indeed, it should continue using the word processing division for its volume typing activities (e.g., settlement agreements, transcripts, etc.).

Labor Relations

Like human relations, observations and the survey in the labor relations department documented a relatively low level of typing that does not justify automated word processing.

Law Department

The law department served as the study team's pilot department, and data were collected and personnel observed there over three different periods. This was done in order to test and refine the data collection instruments and methodology. The study team is especially appreciative of the cooperativeness of the personnel in the law department and their help in the early stages of this study.

Observation of and data collected from the five secretarial/ clerical persons in this department suggest the initial need for three word processing work stations and a single letter quality printer with a dual sheet feeder. (Three positions alone were observed to have typed over 70 hours during one week, producing from 157 to 256 document pages and envelopes.) A more optimal configuration would include a fourth work station and possibly a second letter quality printer. Acquisition of a second letter quality printer should occur only after experience with a single printer in this department demonstrates the inadequacy of this configuration, e.g., printing backlogs or conflict over printing priorities. With the optimal configuration, three work stations should be installed in the secretarial/clerical pool area and one with the city attorney's secretary.

This department should give serious consideration to two important physical and administrative changes. The typing pool (if this is the proper term) should be moved to a physically separate location. At present it occupies what is essentially an

open hallway. This location causes the severe and, in the view of the study team, largely unnecessary interruptions of work.

Second, professional staff in this department need to be more mindful of the secretarial/clerical personnel who work for them. Professional staff frequently interrupt the work being done by the secretarial staff and often abruptly change the nature of the activity being performed, e.g., from typing to filing, from typing to dictation, etc. The added capacities and efficiencies provided by the implementation of automated word processing will not be fully realized unless professional personnel learn to use the secretarial staff more effectively and sensitively.

Mayor's Office

The mayor's administrative office currently has three secretarial/clerical positions (exclusive of the receptionist) and two automated processing stations with one letter quality printer with dual sheet feeder.

The three secretaries in the mayor's office reported 24, 13.5, and 14 hours of typing and production of 439, 129, and 105 document pages and envelopes during the week that data were collected. Observation during the week of May 9 confirmed a high volume of typing activity, much of which involves correspondence and envelope typing.

For this office, a third word processing work station for use by the mayor's appointments secretary (for scheduling and as an additional or back-up word processing station) and an envelope printer are recommended. The volumes of activity in the mayor's

office plus the added capability provided by an automated scheduling system are the justifications for this recommendation.

Mayor's Action Office

A typing survey form was not submitted to this office, but its activity was observed by the study team. No word processing equipment is recommended here. However, consideration should be given to an automated complaint handling system using a data processing capability, as has been previously suggested.[4]

Parks, Recreation, and Public Property Department

Observation of three secretarial/clerical positions in this department occurred during the week of May 31. Both the observation and the survey forms returned by the personnel suggest a relatively low typing level. In two hours of observing three positions, 43 minutes of typing was recorded. The survey forms showed 17.5 and 15.0 hours of typing and 78 documents and envelopes each for two positions. The third position reported minimal typing.

No word processing work stations are recommended for this department. If the typing volume increases in the future and additional evaluations confirm this, then consideration should be given to implementing word processing in the parks department.

Personnel Department

Observation occurred in this department during the weeks of April 30 and May 14 for a total of 5.5 hours. Five positions

were observed. One of the department's two word processing work stations was in use at that time, and personnel were being trained to use the second station.

Two recommendations can be made based on the survey data and the observations. First, the second word processing work station should be implemented as soon as possible and should be used by the benefits secretary and personnel board secretary. Second, this study repeats the recommendation of an earlier report that this department should implement automated data processing at the earliest possible time.[5] To do so will improve the efficiency of record keeping and record management and will enable the department to produce more timely and useful reports on personnel management activities in Omaha.

Word processing work stations will help the department in the areas for which word processing is best suited. For efficient and effective personnel management in an organization as large as the city of Omaha, however, fully automated personnel management software resident on a large interactive computer system is needed.

Planning and Community Development Department

This was the largest and in many ways the most complex of the departments analyzed in this study. For example, it includes 14 full- and part-time secretarial/clerical positions in four main divisions and the director's office. (Survey data were collected for 12 of these positions.)

A total of 14 hours of observation occurred during the weeks of April 30 and May 21 resulting in five hours of typing among the several positions observed. Six positions were observed in the permits and inspections division. This area is very busy due to heavy phone and counter traffic. It is already partially automated with a system connected to the Douglas County mainframe computer that records and prints permits. Very little typing on conventional typewriters was seen. The planning board/rezoning subdivision section is staffed by three secretaries. Each handles a different board that requires recording and typing of minutes. Two of the secretaries were involved in handling 23 cases for the zoning board of appeals requiring 1,000 notification letters and envelopes during the period observed.

Housing and community development is another busy division. Due to staff size and complexity of the work, the secretaries in this area stay occupied. Four secretaries are each assigned various duties, i.e., condemnations, board meetings, or selling of properties. Much of their typing is repetitive letters, contracts, and forms. The director's secretary was observed for one hour. Much of her job involves typing correspondence, reports, and other documents.

Data from the surveys confirmed the relatively heavy amount of typing in this department. For example, six positions reported typing 200 or more document pages and envelopes in the week studied, and one position alone typed over 400 envelopes. Total typing hours reported by the busiest typists were 10, 10, 12, 14, 16, 19, and 23, respectively. This means that half the

secretarial/clerical staff in this department spent no less than 25 percent of their time actually typing, and two of them spent about half of their time typing.

Four word processing work stations are recommended as a minimum configuration. Two work stations and a letter quality printer with a dual sheet feeder and an envelope printer should be located with the zoning board/planning board secretaries for use in creating minutes and other documents for these boards and for sending notifications for hearings on property reclassifications. The third and fourth work stations and a letter quality printer and dual sheet feeder should be located in the community development section of the department for use in community development and related activities and for typing reports and correspondence.

Public Safety

Observation in this office and the returned survey form confirm that this office does not require a word processing work station.

Public Works

Five hours of observation time was spent in this department during the weeks of April 30 and June 4, and four secretarial/ clerical and one data input position out of a total of seven such positions were observed. Survey data were collected from all seven and showed that three positions reported substantial

amounts of typing (23, 17, and 14 hours for production of 393, 637, and 44 document pages and envelopes, respectively).

The initial word processing configuration for this department should be two work stations (one for the department head's secretary and one in the administrative section) and a single letter quality printer with dual sheet feeder. A third work station could be added at a later date if typing volumes increase to the point that the two secretaries have difficulty sharing the work station in the administrative area.

Additional Considerations

Continued use of centralized word processing. Centralized word processing (the city finance department's word processing division) can exist alongside the decentralization of automated word processing in the major city departments. This will be facilitated if the $16 per hour charge-back to city departments for this division's work is eliminated and if a city-wide policy on use of this division (e.g., for lengthy reports, repetitive work, council documents, etc.) is promulgated and enforced.

Training. Secretarial/clerical personnel cannot be expected to learn to operate automated word processing systems without training. A ready resource exists in the city to provide that training. This is the staff of the word processing division who are already a repository of much of the city's word processing expertise. Once they are trained on and become adept with the new word processing equipment and software, they can become trainers of other personnel. They can also provide refresher

training and be available to answer periodic questions from and provide technical consultation to the departments.

Documentation. Many departments that begin to use automated word processing (law, public works, and planning and community development in particular) will need to develop users' level documentation particular to those departments. This documentation, preferably in the form of indexed loose leaf notebooks that can be updated, should include all standard forms, form letters, standard notifications, standard documents, and document paragraphs and clauses that are regularly and repeatedly used in these departments. Both professional staff and secretarial/ clerical personnel should be involved in the development of these manuals. Also, because of their experience and expertise, staff from the word processing division should be called upon to assist the departments in developing this documentation.

Job classification. With the implementation of automated word processing the issue will arrive whether existing secretarial/clerical job classifications are appropriate for persons using automated word processors or whether new job descriptions (and possibly pay rates) should be instituted. Good arguments can be made on both sides of this issue, but resolution of this problem is beyond the scope of this study. The issue should be referred to the job classification study that is to be undertaken for the personnel department in the near future.

Phased implementation. For budgetary reasons and also because the simultaneous installation of between 17 and 21 word

Given the proper software, the interconnection of distributed equipment devices through a central CPU (and possibly central disk unit) can enable them to communicate with one another (e.g., sending messages) allows one office such as the word processing division to create draft documents for printing and revision by the initiating department. This also permits numerous users access to the same data base on disk on the central system.

Shared logic units are generally preferable in large organizations because of their communications and data and text sharing capabilities. According to Auerbach, "The per-station cost (of shared logic systems) can be much lower than that of a system configured from several stand-alone units."[7]

Monitoring. Finally, document production in the departments that implement word processing should be monitored periodically (preferably using the data collection forms and methods employed in this study) to determine what, if any, productivity improvement has occurred, to identify and resolve any problems that may arise, and to determine if additional work stations and printers are required in various city departments.

processing work stations and the training of a large number of secretarial/clerical personnel to operate these systems would be unrealistic, implementation of the recommended systems should be phased in over a period of several months. The suggested order of implementation is:

First phase
Mayor's office
City council
Word processing division

Second phase
Law department
Planning and community development department
Public works department

Third phase[6]
Police division
Fire division

Shared logic v. stand alone systems. One important decision that the city must take prior to initiating procurement of the work stations recommended in this report is whether to acquire a shared logic word processing system with the requisite number of terminals (work stations) and printers or to acquire separate or stand-alone units for the various departments. The main feature that distinguishes shared logic and stand-alone systems is that in a shared logic system, equipment devices (e.g., CRT's and printers) that are distributed among various departments are attached to a common computer central processing unit (CPU) and possibly some degree of central computer storage (usually rigid disk). CRT's in a shared logic system may also have a degree of local intelligence (memory) and storage (floppy disk).

Secretarial Questionnaire

In addition to being observed by the study team and recording their actual time spent on typing and related activities, all secretarial-clerical personnel were asked to complete a questionnaire concerning their jobs and their knowledge of and attitudes toward automated word processing. A summary of responses is presented here.

Question 1 asked secretarial-clerical personnel to estimate in percents how material arrived at their desks for typing. Choices included machine dictation, longhand, shorthand, previous copy from another source, and previous copy of their own work. Citywide, a plurality (39.3 percent) responded longhand, machine dictation followed with 22.6 percent, and previous copy from another source (17.3 percent) was the third most frequent response. Only a few secretarial-clerical staff persons reported that previous drafts of their own work (8.1 percent) or shorthand (7.5 percent) were sources of their typing work.

Notable variations from these citywide figures included the city council (50 percent shorthand), finance administration (50 percent previous copy from another source), mayor's office (73.3 percent machine dictation), and personnel (only 19.2 percent longhand).

Nothing about these responses suggests that automated word processing is not applicable in most city offices. Observation and oral interviews indicated that a fair amount of typing from longhand draft material is revised and retyped, and more revision of such material to improve its quality would occur if a more efficient method (e.g., word processing) were available.

When asked whether the flow of typing work was steady or if peak periods occurred, the citywide response was sharply divided with 49 percent saying "steady" and 51 percent responding "peak periods." The reported peak periods occurred at various times for various departments, such as the end of the month for the finance department, at the beginning of the month for one secretary in the planning department, and at other times for other departments. On the whole, the responses to these questions suggested nothing unusual.

Very little after hours overtime is worked by Omaha's secretarial-clerical personnel. A large majority (84.3 percent) reported "rarely" (less than one day per month) working overtime. The mayor's office and the planning department were the only offices reporting a substantial degree of overtime work.

A similar question was asked regarding working through lunch and breaks to complete typing. Here 74.5 percent of the respondents said they worked through lunch and break periods "rarely," but a total of 21.5 percent responded either "seldom" (one to three days per month) or "sometimes" (one day per week). This type of overtime was reported most frequently in the city council (50 percent of the respondents), mayor's office (66 percent), the planning department (24.9 percent), and the public works department (28.6 percent). On the whole, however, few persons reported working any type of overtime. In addition, a large majority (62.5 percent) of the respondents reported that typing backlogs occurred in their offices only "seldom" (one or two days per week) or "never" (18.9 percent). Only 18.8 percent said

typing backlogs occurred "frequently" (three or four days per week) or "always."

If expected productivity improvements from automated word processing occur in these offices, the reported incidence of typing backlogs should be substantially reduced, if not eliminated. This will be true so long as the amount of typing work remains at existing levels or does not increase proportionately more than the productivity improvement achieved with new equipment.

Although few of the city's secretarial-clerical staff worked overtime or had typing backlogs in their offices, few also reported having to wait on typing work to arrive at their desks. Over two-thirds (68.7 percent) said they "rarely" (less than one day per month) had to wait for typing, 10.4 percent responded "seldom" (one to three days per month), and 14.6 percent said "sometimes" (one day per week). Only 6.3 percent said they had to wait on typing work "frequently" (two to three days per week) or "regularly" (more than three days per week).

Responses to these questions, especially when combined with the typing logs kept by city staff and the study team's direct observations, portray a situation in which the city's secretarial-clerical capability with a few notable exceptions is commensurate with the amount of typing work currently being generated. These staff members generally did not have typing backlogs but also generally did not have to wait for work. They also rarely had to work overtime to keep up with their workloads. Some departments, however, did experience overtime, backlogs of

typing, and peak period typing loads. The latter tended to be departments (e.g., the mayor's office and the planning and public works departments) for which automated word processing has been recommended, based on workload data and direct observation.

As expected, the vast majority (71.2 percent) of typing work in Omaha city departments is done on electric typewriters. Only five persons (9.6 percent) reported use of memory typewriters and 10 (19.2 percent) used word processing systems. Only two (4.0 percent) reported that typing equipment was not located at their desks, and five (10 percent) said they shared their typing equipment with another person.

Most of those surveyed said that typing constituted 50 percent or more of their work. For 33.3 percent of the respondents typing constituted 50 to 75 percent, 13.7 percent responded 76 to 90 percent, and 11.8 percent said 91-100 percent. Most also reported that less than one-quarter of the typing they did involved statistical material. Nearly half (49.0 percent) reported 1-10 percent statistical typing, and 19.6 percent reported 11-25 percent. The departments reporting the greatest amount of typing of statistical material were finance, law, and public works.

The amount of time spent in typing activities reported on the questionnaires appears to be higher than the amount of typing reported on daily typing logs and the amount of typing observed by the study team. This apparent aberration can be explained as a function of one or more of the following: 1) a tendency to emphasize typing when filling out a questionnaire on typing acti-

vities, 2) a conscious or unconscious concern by the respondents that the results of this study could be detrimental to jobs if a high degree of typing activity were not shown, and 3) a smaller amount of typing than usual for the week during which the typing logs were kept and, hence, more accurate reporting on the questionnaires than on the logs. The study team suspects, however, that over-reporting on the questionnaires is more likely the case than under-reporting on the logs.

Very few secretarial-clerical staff typed carbon copies. Over half (54.0 percent) typed no carbons, 28.0 percent typed carbons "a little," and only 18.0 percent typed carbons "a lot." Multi-page (no carbon required) forms were used by 34.7 percent "a little" and by 20.4 percent "a lot," and 44.9 percent reported no use of such forms.

Answers to these questions indicate that most city typing is done on electric typewriters located at secretaries' desks that are not shared with other persons. They also show that most of these persons believe that typing constituted most of their work (even though empirical observation and data may suggest otherwise), and that their typing is largely original narrative material from longhand drafts, machine dictation, or previous copy from another source.

The next set of questions addressed the respondents' attitudes toward and feelings about automated word processing. Secretarial-clerical personnel were first asked how they would feel if their departments installed automated word processing.

Almost two-thirds (63.7 percent) either were "enthusiastic" (43.2 percent) or felt a word processor "would be okay" (20.5 percent). Only 15.9 percent said they did not know enough about word processing to have an opinion. The purchasing division of the finance department and the public works department had the greatest number of respondents (a total of five) who had no opinion. Only 4.5 percent (two persons) of all respondents, however, said they would not like a word processor. The remainder (15.9 percent) reported neutral attitudes.

Next, the respondents were asked to agree or disagree with a number of statements about word processing. Generally speaking, responses to these statements suggest a highly favorable environment for automated word processing in city hall offices. For example, only about one out of six respondents (16.3 percent) said that word processing equipment "frightens" them, and fewer than one in 15 (6.3 percent) felt they "could not learn to operate" a word processor. Nearly all (97.8 percent) agreed with the statement that word processors "would be fun to use," and only 6.5 percent said they "did not want" a word processor in their offices.

Responses were divided on only two statements. Over two-thirds of the respondents (68.1 percent) agreed and nearly one-third (31.9 percent) disagreed with the statement that "word processors would help me to do a better job." Nearly three-quarters (72.1 percent) said they were "excited" about the prospect of having a word processor, but 27.9 percent disagreed

with this statement. The existence of divisions of opinion on these two statements suggests concern on the part of some employees about automated word processing. One possible method to address such concern is to undertake a positive and non-threatening training and familiarization program in the use of word processing equipment prior to and during the implementation of the systems.

Regarding actual experience with word processors, over half (56.6 percent) of the respondents reported that they had not previously used such equipment. The remainder had used a word processor either in city employment (26.5 percent) or in another job (16.9 percent).

However, 82 percent of the respondents said they knew someone else who used a word processor, and 76.5 percent had seen a word processor in use or in a demonstration. Moreover, 94.6 percent of those who knew someone else who used a word processor reported that that person "likes it." In addition, among the respondents who had seen a word processor in use or in a demonstration, 56 percent felt they had learned that word processors can "make office work easier," and 28 percent felt these demos showed they "could learn" to use one. None of the respondents reported that as a result of seeing word processors used they felt they "could not learn" to use one.

In general, data from these questionnaires suggest a very hospitable environment for automated word processing in most Omaha city offices, although some effort will be required to win

the confidence and support of a sizeable minority of the secretarial-clerical staff. The data also suggest that a sufficient amount of typing work is done in most departments to justify acquisition of automated word processing systems, although some over-reporting of the percent of time devoted to typing may have occurred.

FOOTNOTES

[1]"Word Processing," <u>PIN Advisory Report</u>, March 15, 1982 (New York: McGraw Hill, Product Information Network), pp. 5-6.

[2]<u>Ibid</u>., p. 6.

[3]"Data Processing and Information Management in the City of Omaha: Analysis and Recommendations," Center for Applied Urban Research, June 1982, pp. 39-40 and 45-47.

[4]<u>Ibid</u>., pp. 66-68.

[5]<u>Ibid</u>., pp. 59-66.

[6]Based upon a study of these divisions that will be initiated in September, 1984.

[7]"Introduction to Word Processing," in <u>Computers in Local Government</u> 4:2:1, pg. 6, (Pennsauken, NJ: Auerbach Publishers, Inc., 1980).

APPENDIX

Appendix A

Summary of Work Station Requirements

APPENDIX A

Summary of Work Station Recommendations

Office	Work Stations	Printers
City council	1 initial; 2 optimal	1 letter quality with dual sheet feeder 1 envelope printer, optimal
Finance department		
administration	_____	_____
	(possible single work station and single letter quality printer in future)	
purchasing	(use Word Power for bid specifications and data processing for other purchasing activities)	
word processing	6	1 letter quality with dual sheet feeder 1 draft quality 1 envelope
	(Eliminate $16/hr. charge-back and adopt policy re use of centralized word processing.)	
Human relations	_____	_____
Labor relations	_____	_____
Law	3 initial; 4 optimal	1 letter quality printer with dual sheet feeder 2 letter quality printers (optimal)
Mayor's office	1 (additional)	1 envelope printer
Mayor's action office	_____	_____
	(use of computerized complaint handling system)	
Personnel	_____	_____
	(no additional systems)	

Parks, recreation, and public property	_____	_____
Planning and community development	4	2 letter quality printers with dual sheet feeder 1 envelope printer
Public works	2	1 letter quality printer with dual sheet feeder

Totals

Initial implementation	17 work stations	6 letter quality printers with dual sheet feeders 1 draft quality printer 3 envelope printers
Optimal implementation	20 work stations	8 letter quality printers with dual sheet feeders 1 draft quality printer 4 envelope printers

Appendix B

Typing Load in Studied Departments

APPENDIX B

TYPING LOAD BY DEPARTMENT

Department/Week Surveyed	Secretarial/Clerical Position	Hours Typing	General Typing (reports, documents, correspondence)	Statistical Documents	Letter/Form with Fill-ins	Letter/Form with Standard Paragraphs	Repetitive Letters	Photocopies of Material Typed	Other, e.g., Mailing Lists, Labels, and Cards	Envelopes	Total Pages Typed (not including photocopies made)	Total Without Envelopes
City council	1	14	88	3				117	13	99	203	104
Week of 4/30	2	18	114	8			35	280		112	269	157
Finance—	1	No typing for this week										
Administration	2	10	9.5	7	13			128	14	2	46	44
Week of 4/30	3	NA	17.5	1	32			42		16	67	51
Finance—	1	3.75	1						76	2	79	77
Purchasing	2	12	18		17		3	607	22	116	188	188
Week of 5/7	3	NA							59		59	59
	4	10							183		183	183
	5	1.5						28	172	11	211	200
Finance—	1	15	68		8		6	57	98		180	180
Word processing	2	23	85		43		3	140	14	11	156	145
Week of 5/7	3	15	40	6	26	36	7	192	140	14	269	255
	4	23	50		6		29		3	5	93	88
	5	13	82		6		78	361	22	68	256	188
	6	28	102				8	238	24	35	169	134
Human relations	1	4.5	20		10	7	3		5	10	55	45
Week of 5/7	2	3	8							4	12	8
Labor relations Week of 5/7	1	4.25	15					21		1	16	15
Law department	1	24	139	1				84		17	157	140
Week of 4/30	2	7	48		19			40	40	47	207	160
	3	11	50		7	8	11	178		22	98	76
	4	28	71	78			5	617	70	3	227	224
	5	22	165		36	2	43	331	51	10	256	246

Department/Week Surveyed	Secretarial/Clerical Position	Hours Typing	General Typing (reports, documents, correspondence)	Statistical Documents	Letter/Form with Fill-ins	Letter/Form with Standard Paragraphs	Repetitive Letters	Photocopies of Material Typed	Other, e.g., Mailing Lists, Labels, and Cards	Envelopes	Total Pages Typed (not including photocopies made)	Total Without Envelopes
Mayor's office	1	24	138		48	81	18	425	10	109	439	330
Week of 4/30	2	13.5	88					94		41	129	88
	3	14	73	6				306	3	22	105	83
Parks, recreation,	1	17.5	28	6	5		13	115	9	17	78	61
and public property	2	15	58		5	5		26		10	78	68
Week of 4/30	3	Building services—this position is involved in minimal amount of typing										
Personnel	1	NA	61				3	74		15	79	64
Week of 4/30	2	5.5							67		67	67
	3	24	61	20	1	17	48	2		36	285	249
	4	1	1		2			1	3		6	6
	5	NA	41				39	178	32	27	102	129
Planning and	1	3	11		46			320		7	64	57
community	2	12	23		119			8	1	111	253	142
development	3	9	3		10	6	1	73	7	44	71	27
Week of 4/30	4	19	120	2	51	3	39	13	15	140	370	230
	5	16	68		38			202	15	79	200	121
	6	14		4	56				56	462	578	116
	7	NA	27	1	77	12	30	106	37	69	253	184
	8	3							22	5	30	25
	9	10	22		4	16			13		55	55
	10	9	81		44					65	90	25
	11	23	28		40		2	50	5	43	118	75
	12	10	22		143			8	5	37	207	170
Public safety Week of 4/30	1	1										
Public works	2	6	12		113			82		7	132	125
Week of 4/30	3	8	12		2		5	6	9		28	28
	4	17	28		598		2	25		9	637	628
	5	23	110	50	70	50	61	96	10	42	393	351
	6	14	7	13	1		5	7	18		44	44
	7		12	24			7	40		12	55	43

Appendix C

Cost Effectiveness of Automated Word Processing

Appendix C

COST EFFECTIVENESS OF AUTOMATED WORD PROCESSING

The question of the cost-effectiveness of automated word processing is often difficult to resolve directly. As this was not part of the scope of this study, a methodology to estimate these costs and/or benefits has not been developed. However, values and assumptions taken from the literature on this subject can be used to estimate the costs and benefits of the use of this technology in city offices.

To begin with, the cost of implementing word processing technology will include the purchase (or lease or rental) cost of the required software and hardware plus the associated maintenance costs minus the cost of current typing equipment (including maintenance costs) that will be eliminated through the use of word processing. These costs can be calculated rather straightforwardly by your office and will provide an accurate picture of the net dollar outlay required for word processing work stations or systems.

Determining the "effectiveness" side of the coin, however, is another thing altogether and a more tenuous operation. This is especially true because it involves both dollar and non-dollar impacts. For example, the main benefits of word processing are the faster throughput of documents (and hence greater production efficiency) and the additional capabilities these systems provide (e.g., text revision, text storage, mail merge, and others) that

are not available in most city offices today. To estimate the cost impact of these benefits one must either assume a productivity improvement rate based on literature values or document this rate from observation after the introduction of word processing. The productivity rate must then be multiplied by the cost per unit of time of the average secretarial/clerical position. However, the number produced by this calculation, if used improperly, can be misleading.

For example, it would show only the cost of purchasing services comparable to those provided by word processing (either from an outside vendor or by hiring additional staff). It would not show any real dollar savings because in the absence of staff reductions commensurate with the degree of productivity improvement, no such savings would accrue. These numbers, therefore, should be used carefully.

Another and possibly better way to present the impact of word processing would be to describe the actual uses of the word processing in city offices, the additional capacities that the systems provide their users, and, hence, the new functions or activities that can be performed that enable the city to provide services more efficiently and effectively. At the same time, estimates of dollar impact discussed above could be used to show the additional costs of these services if they were purchased from outside vendors or required the hiring of additional staff. Again, no "savings" could be shown, but "cost avoidance" could be.

An exhaustive literature search found myriad anecdotal and experiential reports on the use of word processing. However, these are rarely systematic studies and, therefore, they cannot be relied upon. What is reported below are data from the few reports that were found to be systematic and reliable:

*The PIN Advisory Report (ICMA-McGraw-Hill Product Information Network), dated March 15,1984, claimed that production using a standard electric typewriter amounted to 50,000 lines per year and that production using word processing equipment amounted to 150,000 lines per year.

*Quoting a DataPro report, the PIN Advisory Report cited a $6,400 labor cost of producing 5,000 pages of typing in the city of Boulder, CO using standard electric typewriters and the comparable cost using word processing as $3,600, a 56.3 percent reduction in cost.

*PIN also cited a DataPro report that claimed that if office production consists of production of standard forms or documents that require regular revision, productivity improvement can reach 300 percent.

*A Newsweek article of April 6, 1981 quoted an IBM vice president as saying that a productivity increase of 25 to 200 percent could be expected from word processing.

*An Office article, dated June 1979, on word processing in the city of Garden Grove, CA reported that by implementing five word processing work stations covering half of the city's document production) productivity increased from 17,000 to 35,000 to 4,000 lines per week, over a 100 percent productivity increase.

*An <u>InfoSystems</u> article of March 1980 reported that the Warner-Lambert Health Care Group in Morris Plains, NJ experienced a 66.7 percent workload reduction in the administrative assistant's office and a 300 percent increase in the output of the unit's correspondence secretaries with the implementation of word processing.

Based on these reports, the assumption may reasonably be made that a 100 percent increase in productivity is attainable with word processing. If this assumed productivity improvement factor is combined with an assumed secretarial/clerical cost of $22,500 per year (salary of $12,500 plus 20 percent benefits and 50 percent overhead), an estimated dollar impact of $22,500 per year per word processing work station will be obtained. This is the estimated amount that would be required to purchase the services provided by the word processing system from an outside vendor or to hire the additional staff to produce the services attributable to word processing. Thus, the value or benefit, although not necessarily the cost savings or even the cost avoidance, per installed word processing station would be $22,500. Installation of ten word processing work stations would produce a value of $225,000.

Note that these calculations are based on literature values and assumptions and not documented results. Note also that using the estimated dollar value of word processing to offset the actual dollar outlay required to purchase these systems is not appropriate because in the latter case real dollars are being

used while in the former they are not. To be able to use real offsetting dollars, staff reductions or the avoidance of hirings equal to the estimated productivity impact would have to be demonstrated.

Appendix D

Questionnaires and Data Collection Forms

Dept._____   Date _____

UNO—CAUR
Omaha WP Study
Form 1: Document Production

Type of Document	Action Taken on Document				
	Number of Documents Completed Today	Total Number of Pages Typed Today (include all typing)	Total Number Pages Statistical Material Typed	Total Number of Pages of Xerox Copies of Material You Typed	Comments i.e., multiple originals, unusual document, heavy workload, machine broke, other
General typing (nonrepetitive letters/memos/other documents)					
Statistical documents					
Repetitive letters/memos/other text					
Letters/memos/documents/forms with standard paragraphs					
Letters/memos/documents/forms with fill-ins					
Mailing lists (with or without labels)					
Number envelopes typed					
Other (specify)					

Dept. _____   Date _____

UNO—CAUR
Omaha WP Study
Form 2: Daily Log

Please complete the following form every day for the next week, keeping track of the approximate amount of time that you spend in each of the activities listed below.

Activity	8-9				9-10				10-11				11-12				12-1				1-2				2-3				3-4				4-5			
Minutes	15	30	45	60	15	30	45	60	15	30	45	60	15	30	45	60	15	30	45	60	15	30	45	60	15	30	45	60	15	30	45	60
Typing																																
Taking dictation																																
Using the copy machine (include time waiting)																																
Handling the phone																																
Waiting for work																																
Other (explain)																																
Other (explain)																																

Code _____

Date _____

UNO-CAUR
Omaha WP Study
Form 3: Secretarial Staff Questionnaire

Please complete all of the items on this questionnaire
in order to assist in a study of departmental word processing
needs. Please do not sign your name. Your answers will be kept
completely confidential.

1. In what form does copy arrive at your desk for typing?
    Please estimate in intervals of 10% (10%, 20%, 30%, etc. to
    100%) the amount in each category listed below.
    _____ Machine dictation
    _____ Longhand
    _____ Shorthand
    _____ Previous copy from another source (typed/printed/
                 etc.)
    _____ Previous draft of my typing
    _____ Other (explain)_____
    _____ Other (explain)_____

2. Is the flow of typing work fairly steady or do you have peak
    periods?
    _____ steady
    _____ peak periods

    3. If you answered "peak periods" to question 2, please
        tell us when those peak periods are, how frequently
        they occur, and what activities in your office they
        are associated with.

        _____

        _____

        _____

        _____

4. Do you work overtime (after hours or on weekends or holidays
    to get the typing work in your office completed? (Select one
    answer only.)
    _____ rarely (less than 1 day per month)
    _____ seldom (1-3 days per month)
    _____ sometimes (1 day per week)
    _____ frequently (2-3 days per week)
    _____ regularly (more than 3 days per week)

5. Do you work overtime (during lunch periods or breaks) to get the typing work in your office completed? (Select one answer only.)
    _____ rarely (less than 1 day per month)
    _____ seldom (1-3 days per month)
    _____ sometimes (1 day per week)
    _____ frequently (2-3 days per week)
    _____ regularly (more than 3 days per week)

6. Do backlogs in typing occur in your office? (Select one answer only.)
    _____ never
    _____ sometimes (1 or 2 days per week)
    _____ frequently (3 or 4 days per week)
    _____ always (every day of the week)

7. Do you have to wait for typing work?
    (Select one answer only.)
    _____ rarely (less than 1 day per month)
    _____ seldom (1-3 days per month)
    _____ sometimes (1 day per week)
    _____ frequently (2-3 days per week)
    _____ regularly (more than 3 days per week)

8. What type of equipment do you currently use for typing?
    _____ electric typewriter
    _____ manual typewriter
    _____ memory typewriter
    _____ word processing system
    _____ composor typewriter
    _____ other equipment (explain)_____

9. Is a typewriter located at your desk?
    _____ yes
    _____ no

10. If you answered "no" to question 9, where is it located?

    _____

    _____

11. Do you share a typewriter with any other persons? If so, how many?
    _____ yes (How many?_____)
    _____ no

12. How many staff persons do you serve as a typist?
    _____ (number)

13. How much of your job involves typing?
    _____ 0-10%
    _____ 11-25%
    _____ 26-50%
    _____ 51-75%
    _____ 76-90%
    _____ 91-100%

14. How much of your typing work involves the typing of statis-
    tical or tabular material?
    _____ 0-10%
    _____ 11-25%
    _____ 26-50%
    _____ 51-75%
    _____ 76-90%
    _____ 91-100%

15. Do you type any carbon copies?
    _____ no
    _____ yes, a little
    _____ yes, a lot

16. Do you type on any multi-pact (e.g., no carbon required)
    paper or forms?
    _____ no
    _____ yes, a little
    _____ yes, a lot

17. How would you feel if your department were to install an
    automated word processing system? (Select one answer only.)
    _____ Don't know enough about WP to have an opinion.
    _____ I wouldn't like it.
    _____ I'm really neutral.
    _____ A word processor would be ok (more than neutral but
                  not enthusiastic).
    _____ I'd really like to have a word processor.

18. Please indicate whether you agree or disagree with these statements about word processors. (Please answer all questions.)

agree	disagree	
_____	_____	Automated word processing equipment frightens me.
_____	_____	I don't think that I can learn to operate a word processor.
_____	_____	Word processors look like they would be fun to use.
_____	_____	Word processors would help me do a better job.
_____	_____	I'm excited about the prospect of having a word processor to use.
_____	_____	I don't want to have to use a word processor.

19. Have you ever operated an automated word processor, either in your current job or elsewhere?

_____ no
_____ yes, in current job
_____ yes, different job in city employment
_____ yes, different job not in city employment

20. Do you know anyone either in city employment or elsewhere who uses an automated word processor?

_____ yes
_____ no

21. If yes to number 20, how does that person feel about the word processor?

_____ likes it
_____ neutral
_____ dislikes it

22. Have you ever seen an automated word processor used in an office or demonstrated by a vendor?

_____ yes
_____ no

23. What do you think you learned from seeing it operate?
_____ Nothing.
_____ They are hard to use.
_____ They make office work easier.
_____ I can learn to use one.
_____ I can't learn to use one.
_____ Other (explain) _____

_____

_____

24. In your own words, please tell us whether you would like to
see a word processor in your office and why or why not.

_____

_____

_____

_____

25. Would you like to add any comments to this questionnaire?

_____

_____

_____

_____

26. Has this been a fairly normal week?
_____ yes
_____ no (If no, please explain)

_____

_____

_____

_____

UNO-CAUR
Omaha WP Study
Form 4: Department Head Interview

1. What major documents are produced by your department? Their
    length? How frequently? Are they original copy or do they
    involve updates of previous documents? Do they require
    revisions(s) before final production? How many copies of the
    final document are typically produced?

	Document Name	Length	Frequency	Original or Previous Copy	Revisions Needed	Number Copies	Anything Else
1.							
2.							
3.							
4.							
5.							

(Use back of sheet for additional major documents.)

2. What sorts of documents are prepared in your department that
    are of a repetitive nature (forms, form letters) or use stan-
    dard paragraphs? What are these documents? How frequently
    are they produced?

_____

_____

_____

_____

_____

3. Do you believe a typing "problem" exists in your department?
    If so, how would you describe it?

    _____

    _____

    _____

4. Are there periodic typing "crunches" in your department?
    When do they occur? Why?

    _____

    _____

    _____

5. Does your secretarial/clerical staff work overtime? How
    much?_____

6. Does your secretarial/clerical staff wait for typing work?
    How frequently? What percent of their time?_____

    _____

7. Would you like to have a greater capability to work on rough
    draft or second (or even third) drafts of documents but can-
    not do so now because of the typing limitations of your
    office?_____

    _____

    _____

8. Could you please explain the flow of typing work in your
    office? That is, where is the material generated, who
    controls the flow, where is it produced, etc?

    _____

    _____

    _____

    _____

9. Does a logging system exist in your office for requests for typing and/or to control the flow of typed work?

_____ yes

_____ no

10. How would you feel about installing automated word processing in your office?

_____

_____

_____

11. How many work stations do you think would be required? Located where?

_____

_____

12. Are there any clerical/secretarial personnel in your office who will be either strongly opposed to, strongly in favor of, or frightened by the prospect of automated word processing equipment? Who? How many? _____

_____

13. The number of secretarial/clerical personnel in your department is _____.

14. How many professional staff do these secretarial/clerical personnel provide typing support for? _____

15. Do you feel the need for an interoffice mail, messaging, or document transmittal capability? (For example, use of word processing terminals or computer terminals and printers to transmit and receive messages and documents to and from other personnel in your department, to other departments, to "Word Power," etc.)

16. Would you like to add any comments to this questionnaire?

_____

_____

_____

Dept. _____   Date _____

UNO—CAUR
Omaha WP Study
Form 5: Observation Data

Please complete the following form every day for the next week, keeping track of the approximate amount of time that you spend in each of the activities listed below.

Activity	8-9				9-10				10-11				11-12				12-1				1-2				2-3				3-4				4-5			
Minutes	15	30	45	60	15	30	45	60	15	30	45	60	15	30	45	60	15	30	45	60	15	30	45	60	15	30	45	60	15	30	45	60
Typing																																
Taking dictation																																
Using the copy machine (include time waiting)																																
Handling the phone																																
Waiting for work																																
Other (explain)																																
Other (explain)																																

Dept. _____   Date _____

UNO—CAUR
Omaha WP Study
Form 6: Document Production/Observation

Type of Document		Action Taken on Document			
	Number of Documents Completed Today	Total Number of Pages Typed Today (include all typing)	Total Number Pages Statistical Material Typed	Total Number of Pages of Xerox Copies of Material You Typed	Comments i.e., multiple originals, unusual document, heavy workload, machine broke, other
General typing (nonrepetitive letters/memos/other documents)					
Statistical documents					
Repetitive letters/memos/other text					
Letters/memos/documents/forms with standard paragraphs					
Letters/memos/documents/forms with fill-ins					
Mailing lists (with or without labels)					
Number envelopes typed					
Other (specify)					

54