

1984

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## Recommended Citation

Norris, Donald F., "Small Local Governments and Information Management" (1984). *Publications Archives, 1963-2000*. 220.  
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SMALL LOCAL GOVERNMENTS AND INFORMATION MANAGEMENT

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## SMALL LOCAL GOVERNMENTS AND INFORMATION MANAGEMENT

### Introduction

During the past few years, an increasing amount of research has been conducted on the subject of computers and information management in small local governments. These are defined as cities of less than 50,000 population and counties of less than 100,000. Much of this research has been conducted within single states or multi-state regions in the United States. One of its primary purposes seems to have been to assist in the development of training and technical assistance programs on computers and information management for small local governments.<sup>1</sup>

Data from these studies have filled a major gap in the literature on governmental use of computers. The only prior research of major consequence on this subject was conducted in the mid-1970's and focused on large local governments (cities over 50,000 and counties over 100,000).<sup>2</sup> Although patterns of computing and information management in small local governments

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<sup>1</sup>See, for example, Curtis Braschler, County Government Computer Utilization and Application in Four North Central States (Ames, IA: North Central Regional Center for Rural Development, 1983); David L. Damm-Luhr, "Microcomputing in Organizations: Experiences in Public Transportation Agencies," a paper written for the U.S. DOT Transportation Systems Center, Cambridge, MA, 1984; John I. Manock, "The Use of Microcomputer Systems by Local Governments," a paper written for the North Carolina Local Government Data Processing Center, Inc., 1983; John W. Moore, Q. Whitfield Ayres, and Paul L. Sifford, The South Carolina Survey of the Use of Computer and Communication Technology (Columbia, SC: Institute of Information Management, 1983); Donald F. Norris, "Computers and Small Local Governments: Uses and Users," Public Administration Review (January/February, 1984); and Donald F. Norris and Vincent J. Webb, Microcomputers: Baseline Data Report (Washington, DC: International City Management Association, 1983).

<sup>2</sup>See Kenneth L. Kraemer and James L. King, eds., Computers in Local Government (New York: Praeger, 1977), Vols. I and II.

could be hypothesized from this earlier work, no empirical data existed with which to test the hypotheses and to provide an unambiguous picture of computing and information management in small local governments.

One question that may legitimately be asked is why examine computer use in small local governments in the first place? After all, the large cities and counties contain the vast majority of the nation's population, urban problems, public service requirements, and, quite probably, need for cost-effective governmental use of information management technology. In addition, large local governments constitute a lucrative market for the sale of computer equipment and services.

The rationale for studying computing in small local governments stands on its own and exists quite independently of these considerations. According to recent data, the vast majority of American cities and counties are small local governments. For example, 93.2 percent or 6,155 of America's 6,603 cities have populations of less than 50,000, and 87.3 percent or 2,566 of the country's 2,940 counties have fewer than 100,000 residents. (See Table 1.)

Second, substantial evidence exists to indicate that small local governments themselves constitute a considerable market for new or replacement information management technology. A sizeable number of dated or antiquated computers are owned by local governments, according to regional and single state studies.<sup>3</sup> These systems will have to be replaced within the next few years if for no other reason than the difficulty and expense of obtaining continuing hardware maintenance and programming support. Kraemer and King

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<sup>3</sup>Norris, "Computers and Small Local Governments: Uses and Users," pp. 72-73; and Donald F. Norris, "Computing in Small Local Governments in Nebraska," in a paper presented at the 1984 annual meeting of the American Society for Public Administration, pp. 6-7.

came to a similar conclusion in a 1981 article forecasting the future of information management in local governments in the United States in the 1980's.<sup>4</sup> In addition, other studies have found that numerous local governments are actively planning to acquire new or upgrade existing computer systems in the next two years.<sup>5</sup>

TABLE 1  
POPULATION OF AMERICAN CITIES AND COUNTIES

Population	Cities		Counties	
	Number	Percent	Number	Percent
1,000,000+	6	0.09	20	0.68
500,000-999,999	17	0.26	48	1.63
250,000-499,999	34	0.51	88	2.99
100,000-249,999	113	1.71	218	7.41
50,000- 99,999	278	4.21	374	12.72
25,000- 49,999	613	9.28	611	20.78
10,000- 24,999	1,532	23.20	957	32.55
5,000- 9,999	1,739	26.34	448	15.24
2,500- 4,999	<u>2,271</u>	<u>34.39</u>	<u>176</u>	<u>5.99</u>
Total	6,603	99.95	2,940	99.99

Source: The Municipal Yearbook, 1984 (Washington DC: International City Management Association, 1984), pages xvii-xviii.

<sup>4</sup>Kenneth L. Kraemer and John L. King, "Computer Technology in Local Governments in the 1980's: A U.S. Forecast," International Review of Administrative Sciences, No. 2, 1981, p. 118.

<sup>5</sup>See, for example, Norris, "Computers and Small Local Governments: Uses and Users," pp. 75-76; Norris, "Computing in Small Local Governments in Nebraska," pp. 9-11; Norris and Webb, op. cit., p.2; Moore, Ayres, and Sifford, op. cit., pp. 21-22; Braschler, op. cit., pp. 46-47; Jane Zawistowski and Tom Morton, Computerization in Indiana County Governments (Bloomington, IN: School of Public And Environmental Affairs, Indiana University, 1984), pp. 2-3.

Perhaps most important, a revolution has occurred in the field of information management technology that has had tremendous effects on both computer hardware and software. This revolution has resulted in the development of small, low-cost, yet highly powerful and sophisticated computer devices as well as what has come to be known as "user friendly" software or programming. Moreover, two kinds of programming that are of great interest to local governments have been developed. The first is the so-called "generic" software that is written for a general application, is relatively easy to use, runs on many different kinds of computers, and is applicable to the activities of a wide variety of organizations. This generic software includes spreadsheets, graphics packages, word processors, and data and file management programs. "Packaged" programming that will run on low-cost microcomputers has also increased in recent years. This type of programming is written exclusively to perform a wide variety of local government functions such as accounting, payroll, utility billing, police records, equipment management, and many others.<sup>6</sup>

Generic software combined with packaged local government programming on microcomputers has opened an entirely new world of computing and information management to small local governments. Heretofore, owing to their size, staff, and budget limitations, many small local governments were effectively precluded from using computer technology in their activities. The revolution in computer technology has brought computerized information management within their grasp and functional capabilities for the first time.

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<sup>6</sup>An important aspect of a two-year project on microcomputers and local governments, directed by the author and funded by the W.K. Kellogg Foundation, was determination of the existence of "packaged" software. See Donald F. Norris, Microcomputers and Local Governments: A Handbook (Omaha, NE: Center for Applied Urban Research, University of Nebraska at Omaha, 1984), pp. 28 and 96-101.

Three aspects of the findings of studies on computers and small local governments--extent of adoption, governmental use of computers, and future plans--will be addressed in the paragraphs that follow.

### Adoption

The work by Kraemer and his associates on computing in large local governments in the mid-1970's found that over 90 percent used computers.<sup>7</sup> As government size declined, so did the likelihood of computer use. In fact, size has become the most widely used variable to predict governmental use of computers. In addition, a study for the International City Management Association in 1975 found that 58 percent of city governments from 25,000 to 49,999 and 36 percent of cities of 10,000 to 24,999 used them.<sup>8</sup>

Owing to the passage of time and the greater availability of computer systems at lower costs, more small local governments in the mid-1980's use computers. For example, a 1983 study in the plains and mountains states found that 53 percent of small local governments in that area used computers in their operations.<sup>9</sup> This was 17 percent greater than the ICMA study reported in 1975 among city governments of 10,000 to 24,999 population but 5 percent less than cities of 25,000 to 49,999. Similarly, a study among small city and county governments in southeastern Nebraska in 1984 found that 64.3 percent used computers.<sup>10</sup>

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<sup>7</sup>Rob Kling and William H. Dutton, "The Computer Package: Dynamic Complexity," p. 30, in James Danziger, William H. Dutton, Rob Kling, and Kenneth L. Kraemer, eds., Computers and Politics: High Technology in American Local Governments (New York: Columbia University Press, 1982).

<sup>8</sup>Kenneth L. Kraemer, William H. Dutton, and Joseph R. Matthews, "Municipal Computers: Growth, Usage and Management," Urban Data Service Report (Washington, DC: International City Management Association, 1975), p. 2.

<sup>9</sup>Norris, "Computers and Small Local Governments: Uses and Users," p. 70.

<sup>10</sup>Norris, "Computing in Small Local Governments in Nebraska," Figure 2, p. 14.

Studies of computing in other parts of the country have tended to confirm these findings even if the specific results have differed somewhat. For example, Moore, Ayres, and Sifford found that 81.0 percent of small city and county governments in South Carolina used computers. Even among the smallest category of governments that they examined (2,500 to 10,000), a surprising 65 percent used computers in some manner.<sup>11</sup> Other studies have produced similar results, finding greater use of computers by small local governments in the mid 1980's than ten years ago.

That these governments use computers with greater frequency than ten years ago should be no surprise. Two things, however, about this use are somewhat unique. The first is that the extent of computer adoption in general among small governments appears to be greater than that of small businesses. According to current data, only about 11.1 percent of small businesses (defined as companies with annual sales of less than \$25 million or net worth between \$10,000 and \$500,000 and fewer than 500 employees) use in-house computers as their primary mode of data processing, and only 16 percent have any in-house computing capability.<sup>12</sup> The extent of general computer adoption by small local governments in America's heartland alone is nearly five times this great, and adoption in other areas of the country is even higher.<sup>13</sup>

Second, small governments, however, do not compare well to small businesses in terms of adoption of the personal or microcomputer, the most

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<sup>11</sup>Moore, Ayres, and Sifford, op. cit., pp. 7-8.

<sup>12</sup>FOCUS Research Systems, Inc., Small Computers for Small Business (New York: Dun and Bradstreet, 1983), pp. iv and 5.

<sup>13</sup>Norris, "Computers and Small Local Governments: Uses and Users," p.70; and Moore, Ayres, and Sifford, op. cit., among others.

recent addition to the computer market. A 1983 study for the International City Management Association, for example, found that 13 percent of cities nationwide used micros, and among small cities, 10.7 percent did so.<sup>14</sup> Moreover, 35 percent of all cities surveyed said they planned to acquire micros in the next two years.<sup>15</sup> A study by Dun and Bradstreet in 1983 found that 32 percent of all businesses used micros.<sup>16</sup> Adoption rates for small businesses by firm size were: 1-19 employees--14.5 percent, 20-99 employees--22.4 percent, and 100-499 employees--27.3 percent.<sup>17</sup> Thus, small local governments are outstripped by almost every category of small business in the use of micros.

As significant as this difference appears, the reader should be aware that although the ICMA study was published in July, 1983, data for it were gathered in the fall of 1982. Data for the Dun and Bradstreet survey were collected over six months later, in early June, 1983. This time difference could account for some of the difference in reported adoptions. In addition, according to Apple Computer president John Sculley, only about 7 percent of Americans had access to a micro either at home or in the workplace by 1983.<sup>18</sup> This means that both small local governments and small business adoption of this technology are ahead of the general use of it.

Local governmental use of computers would not be expected to compare favorably with business use because of the oft-repeated finding that

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<sup>14</sup>Norris and Webb, op. cit., pp. 1-2 and Table 1.

<sup>15</sup>Ibid., p. 2.

<sup>16</sup>FOCUS Research Systems, op. cit., pp. 9.

<sup>17</sup>Ibid., p. 20.

<sup>18</sup>InfoWorld, July 18, 1983, p. 31, interview with John Sculley.

government lags behind the private sector in the adoption of innovative technology. For example, according to Kraemer and King, "The time lag for innovations to reach the great bulk of local governments is . . . on the order of fifteen years after introduction." They went on to say, "Technologies that are simple and inexpensive can be adopted with ease, but computing is not such a simple technology."<sup>19</sup>

What appears to have happened in the last few years however, is that computing has been greatly simplified, especially with microcomputers and user-friendly generic and packaged local government software. It most certainly has been greatly reduced in price. These factors, then, have enabled small local governments to adopt the technology at rates that, in the case of general computer use, exceed that of small businesses. In the case of personal computers, however, small local governments fall behind the adoption rates of small businesses.

#### Governmental Use of Computers

Although new hardware technologies and new, easy to use software have entered the marketplace in abundance in the past decade, except for increased adoption of computers, small local governmental use has not changed much nor are these uses very different from those by larger governments a decade ago or currently by business organizations.

Based on their exhaustive study begun in the mid-1970's, Kraemer and his associates found that the vast majority of local governmental computer uses involved what can be called routine "housekeeping" activities. These were mainly financial management and related functions and basic record keeping.<sup>20</sup>

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<sup>19</sup>Kraemer and King, "Computer Technology in Local Governments in the 1980's," p. 16.

<sup>20</sup>Kraemer and King, Computers in Local Government, Vol.1, p.25.

Recent studies of computer use by small local governments have produced remarkably similar findings. One of many possible examples that could be cited is the following:

Maine municipalities use the computer primarily to perform routine financial tasks such as maintaining accounts receivable and payable and the general ledger, and for payroll, tax billing, and tax assessment. These five applications are found in over 80 percent of all [Maine] municipalities.<sup>21</sup>

These findings have been repeated in studies across the nation. In cities and counties in South Carolina and in southeastern Nebraska, in county governments in Indiana and five other north central states, in city governments in seven plains and mountain states, and in cities nationwide using microcomputers, financial management applications on computers of all sizes predominate.<sup>22</sup> The major exceptions to these findings are that in some county governments property tax applications are more likely to be computerized than basic accounting functions.<sup>23</sup> Also, on microcomputers in city governments, word processing is more likely to be automated than any other single function.<sup>24</sup>

What stands out from these studies is that very few applications outside of the financial management area are automated in small local governments, regardless of the size or type of computer use. Indeed, in the area of

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<sup>21</sup>James D. Sorg and Garrett Bozylinsky, "Status and Trends in Municipal Computer Use in Maine," a paper presented at the Regions I/II American Society for Public Administration Conference, New York, October, 1980.

<sup>22</sup>Moore, Ayres, and Sifford, op. cit., p. 14; Norris, "Computers in Small Local Governments: Uses and Users," p. 74; Norris, "Computing in Small Local Governments in Nebraska," pp. 7-9; and Norris and Webb, op. cit., pp. 7-8.

<sup>23</sup>Braschler, op. cit., p. 31; and Zawistowski and Morton, op. cit., pp. 2-3.

<sup>24</sup>Norris and Webb, op. cit., p. 7.

computer applications, more so than in hardware technology, Kraemer and King's observation about adoption lag time is more likely to be correct. This is so because of the lag time between the introduction of new hardware and the development of application software to run on it, especially application programming for the relatively narrow local government market.

In addition, until the last few years when low cost minicomputers and more recently microcomputers became available and along with them wholly new types of programming (generic and packaged software), local governments have had few options but to go without automated data processing, purchase it from outside organizations (e.g., other governments or "service bureaus"), or hire a seemingly endless number of data processing staff to write and then maintain application programs. Needless to say, the latter two options, expensive as they are, have meant that small local governments did not use computers with a high frequency.

The recent revolution in the industry affecting both hardware and software has changed this situation dramatically, and small local governments are adopting computer technology in increasing numbers. Furthermore, they are adopting computers to assist in the performance of functions for which the need is greatest, the greatest potential service improvement or cost payback, and for which the greatest amount of application software is available. These functions are largely, although not exclusively, financial management activities.

Computing in small local governments has taken a direction that closely parallels that of small businesses. One study of small business use of computers found that of the top seven applications for which computers were used, all but one directly involved financial management. In order of frequency of use these functions were: accounts receivable, accounts payable,

inventory control, payroll, billing and invoicing, general ledger accounting, and, finally the only non-financial management application, word processing.<sup>25</sup> Interestingly, like studies of computing in governments, this study also found a clear relationship between size of business and the likelihood of computer adoption. The larger the business organization (as measured by number of employees) the more likely it was to be computerized.<sup>26</sup>

Another study, this one of the penetration of microcomputers into business organizations of all sizes, found that 31.9 percent of all businesses had one or more micros and that a positive relationship existed between business size and the likelihood of micro adoption.<sup>27</sup> Here, too, the most frequent use of microcomputers was in the area of financial management. In order of frequency of reported use, the top seven applications were: accounting, financial analysis/spreadsheet use, inventory control, purchasing, customer credit analysis, word processing, and data base management.<sup>28</sup> Only the latter two activities were not directly related to financial management. However, in businesses, word processing and data base management are probably most often performed in close association with and support of the financial activities of the firm.

#### Future Plans

In addition to identifying patterns of computer adoption and use, many recent research studies have also endeavored to determine the extent to which small local governments plan to acquire new or upgraded computer technology.

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<sup>25</sup>FOCUS Research Systems, op. cit., p. 23-24.

<sup>26</sup>Ibid., p. 7.

<sup>27</sup>Dun and Bradstreet Credit Services, Personal Computer Survey (New York: Dun and Bradstreet, Inc., 1983), pp. 10, 13, and 19-21.

<sup>28</sup>Ibid., pp. 24-37.

For example, Braschler's study of county government use of computers in four north central states found that 13.5 percent of the counties planned to purchase new or upgrade existing equipment.<sup>29</sup> Among small local governments in southeastern Nebraska, 46.2 percent of cities and 28.9 percent of the county offices said they planned to acquire new or upgraded systems in the next two years.<sup>30</sup> Plans to acquire new or upgrade existing systems were also found among 25.5 percent of small cities in seven plains and mountain states,<sup>31</sup> 35.3 percent of municipalities nationwide with specific regard to microcomputers,<sup>32</sup> three-fourths of Indiana's non-computerized counties,<sup>33</sup> and 46.4 percent of South Carolina's cities and counties.<sup>34</sup>

Reported local government plans to acquire computer technology, however, are somewhat behind those of small businesses. A 1983 survey of small business use of computers found that "expected new acquisitions and upgrades during the next twelve months represent a +47% increase over the current installed base." In the first half of 1983, this survey also found a 25.5 percent increase in computer acquisitions by small businesses over the installed base at the beginning of that year.<sup>35</sup>

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<sup>29</sup>Braschler, op. cit., pp. 46-47.

<sup>30</sup>Norris, "Computing in Small Local Governments in Nebraska," pp. 9-11.

<sup>31</sup>Norris, "Computers in Small Local Governments: Uses and Users," pp. 75-76.

<sup>32</sup>Norris and Webb, op. cit., p. 2.

<sup>33</sup>Zawistowski and Morton, op. cit., p. 3.

<sup>34</sup>Moore, Ayres, and Sifford, op. cit., p. 21.

<sup>35</sup>FOCUS Research, Inc., op. cit., p. 2.

Similarly, a 1983 Dun and Bradstreet survey of personal computer use by businesses found that 43.3 percent of firms then using micros planned to place orders for one to over 100 new machines in 1984.<sup>36</sup> Furthermore, over one-fourth (26.4 percent) of the firms that did not use micros at the time of the survey said they planned to acquire one or microcomputers in 1984, and 16.7 percent said they were unsure, suggesting that they might make such a purchase.<sup>37</sup> For both groups, basic financial management applications, word processing, and data base management were the primary areas in which the new micros would be used.<sup>38</sup> With the exception of data base management, these applications are not substantially different from those that are automated by small local governments.

Regardless of specific responses reported in a given survey, clearly small local governments across the nation are in the initial stage of a period when larger and larger numbers of new computer systems will be acquired and existing ones upgraded. These organizations should be aware of several potential pitfalls. When asked, most governmental users of information management technology gave high marks to their computer systems, but they also pointed to problem areas. These included such things as inadequate user training, under-utilization of the hardware, inadequate software, vendor

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<sup>36</sup>Dun and Bradstreet Credit Services, op. cit., p. 67. The figure of 43.3 percent was derived from Table 25, p. 67, by dividing the total respondents to this question (349) by the total respondents in the survey who reported owning microcomputers (806). The latter figure was derived by multiplying the total respondents by the percentage reporting micro ownership (32 percent.)

<sup>37</sup>Ibid., p. 83.

<sup>38</sup>Ibid., pp. 73 and 90.

related problems, hardware failure, staff resistance to change, and many others.<sup>39</sup>

These governments should also be aware that computer system procurement, regardless of whether the system is a microcomputer or a larger system, can be an arduous and time-consuming process. It is also a process that requires skills and knowledge different from those ordinarily found in small governmental organizations. These include some degree of knowledge of computers and data processing technology and the ability to plan and manage complex, multi-stage projects.

Numerous publications and a variety of sources of technical assistance are available to the governmental administrator who is not a computer expert and is in need of assistance. Helpful publications include periodicals like Byte, PC World, InfoWorld and many more; various other publications such as this author's Microcomputers in Local Government: A Handbook; and texts and procurement guides available from organizations like the International City Management Association, the Government Finance Officers Association, the National Association of Accountants, and others.<sup>40</sup> Sources of technical assistance include management consulting firms, auditing and accounting firms, data processing consultants, and university technical assistance or extension organizations in a growing number of institutions, among others.

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<sup>39</sup>See, for example, Moore, Ayres, and Sifford, op. cit., pp. 26-36; Donald F. Norris and David R. DiMartino, Computers and Small Local Governments; A Survey of Computing in the Plains and Mountain States (Omaha, NE: Center for Applied Urban Research, University of Nebraska at Omaha, 1983), pp. 13-18; and Norris and Webb, op. cit., pp 3-7.

<sup>40</sup>See, for example, Norris, Microcomputers and Local Government: A Handbook; James R. Griesemer, Microcomputers and Local Government (Washington, DC: International City Mngement Association, 1983); Managing Microcomputers (New York: National Association of Accountants, 1984); and Microcomputers in Government (Chicago, IL: Government Finance Officers Association, 1984).

## Conclusion

During the past ten years a revolution has occurred in the field of information management technology affecting both computer hardware and software. Today's computer equipment is smaller, less expensive, more powerful, and easier to use than that of just a few years ago. Similarly, a new generation of programming is available to make computer use even easier.

This software is known as "user friendly" and can be used with minimal training by persons who have little or no prior background or training in data processing. Two particular types of programming that are of special interest to local governments are generic programming for such activities as word processing, spreadsheet analysis, and data base management, and packaged software written exclusively to perform a variety of local government functions.

This revolution has brought computer technology within the financial grasp and functional capabilities of even the smallest of local governments and in part has resulted in the increasing adoption and use of computers by these governments throughout the United States. However, the uses to which computers are put in small local governments today do not differ much from those by larger governments a decade ago or by contemporary business organizations. These functions mainly involve financial management and related activities and basic record keeping.

Contrary to the findings of earlier studies and to predictions by scholars, general computer adoption and use by small local governments are not substantially different from those of small businesses. Only in the area of microcomputers do small business adoption rates outstrip those of small governments, and, even in this case, the functions for which micros are acquired are quite similar. Moreover, adoption tends to be strongly related

to the size of the organization in both cases. That is, the larger the governmental or business organization, the more likely it is to use computer technology.

Finally, substantial numbers of small local governments plan to acquire new or upgrade existing computer systems in the near future. So, too, do small businesses, although their future adoption rate may be somewhat higher than that of small local governments, especially with respect to the adoption of microcomputers.

Data from recent studies of local government use of computers suggest a large and growing market for the technology. This should be welcome news for at least three groups. The first is the vendors who have invested scarce resources in the development of systems for local governments because as the market for their products expands so do their sales and, hopefully, their profits. The second group that should benefit is small local governments. As the local government market for information management products and services grows, so do the number and quality of data processing alternatives available. Presumably, also, product competition will serve to stabilize or even reduce prices making the cost of computer systems less expensive.

The third group to benefit will be the citizenry. Improved efficiency and effectiveness of governmental services that should follow from the intelligent application of modern, low cost computer technology should be welcomed by those who both finance and receive local public services.