

◆ INTERNATIONAL NOTE

## **THE IMPACT OF MICROCOMPUTER SYSTEMS ON SMALL BUSINESSES: ENGLAND, 10 YEARS LATER**

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A little over 10 years have elapsed since IBM made the microcomputer respectable by launching its own personal computer (PC) onto the market in 1981. This anniversary seemed an appropriate time to investigate the extent of usage, the reasons for adoption, and the purposes for which microcomputer systems are now being used in small businesses. In the past decade, a number of studies have been conducted both into these aspects of microcomputer usage and the characteristics of small businesses.

Consideration of small business characteristics is important in order to avoid the dangers of technical determinism (Pfaffenberger 1991). Their special circumstances have been discussed by the Bolton Committee (CMND 4811, 1971) and Mackness (1975). Some of the latter's findings were later published in Barnett and Mackness (1983). These authors suggested that small businesses should not be thought of as miniature versions of large businesses but quite different and unique in their own right. For example, some may often assume characteristics of families or homesteads, and growth is not necessarily a prime motivating force.

In the literature, there is evidence to suggest that most of the impact of microcomputers on small businesses has been basic and operational rather than decisional (Raymond and Magnenat-Thalmann 1982, MaLone 1985, Nickell

and Seado 1986). However, there is also some evidence that the main use of microcomputers is moving from record keeping (word processing and bookkeeping) to decision making (financial modeling and data management) (Cerullo 1980, Mahmood 1982, MaLone 1985, Commission of European Communities 1985, Sanders 1988). However, this study will show this trend is not apparent in the smaller English businesses sampled (fewer than 50 employees).

In large businesses, managers rely on decision support systems (DSS) for effective decision making. Chen (1989) and Sullivan and Shively (1989) point out, however, that this technology has not been fully utilized by small businesses despite advantages cited by several authors. Gupta and Harris (1989) suggested that DSS would lead to a better understanding of the small business, and Amer and Bain (1990) suggested that it would lift the focus of business from operational matters to long-term business success.

The purpose of this study was to look at how a sample of small businesses were actually using microcomputer-based technology in England 10 years after its effective introduction.

### **Method and Sample**

The study was conducted in May 1991 and was divided into two parts: postal questionnaires and follow-up interviews. It was based in Norfolk, a rural

county in eastern England, characterized by a large number of small companies of a craft or agricultural nature. Two hundred and sixteen companies were randomly selected for the questionnaire survey from the Norfolk Industrial Directory (Norfolk County Council 1990). According to the directory, all of the companies chosen conformed to the definition of a small business in the United Kingdom (UK) Companies Act 1989 (i.e., they had fewer than 50 employees and were not subsidiary companies).

The questionnaire\* was arranged into a number of sections that were used to investigate the nature of the company, the staff's experience with computers, the use of microcomputer systems, and the influence of computerization in small businesses. In order to boost the response rate, respondents were asked to return blank questionnaires if they were too busy to fill them in and 125 responses (75 complete and 50 blank) were received in one month. The final usable sample, comprising 67 respondents, represented a response rate of 31 percent. Of the 67 companies, 37 used a microcomputer system, and 30 did not use any form of computer or computer bureau.

Ten companies, comprising five microcomputer users and five non-microcomputer users, were chosen for follow-up interviews to further investigate the characteristics of small businesses and their owners, and how their attitudes and experiences affected the process of computerization and the implementation of microcomputer systems. The use of semi-structured interviews was considered vital to minimize interpretation problems normally associated with attitudinal questionnaires.

## Results

Probably the most interesting result from the questionnaire survey was that the proportion of respondent companies

using microcomputer systems to those that did not was roughly even (37:30, see table 1). These figures may be compared with previous studies (see table 2), and they indicate a relatively high level of computerization compared with studies on companies of a similar size. Usage did not appear to correlate with traditional indicators such as industry type, number of employees, total assets, or sales. It suggested however that companies established within the last 10 years were more likely to be computerized.

Of the user businesses, most have had more than three years experience of computerization and normally obtained advice about selection of microcomputer systems from equipment suppliers (see tables 3 and 4). With the exception of one company (which used a minicomputer with five terminals), almost all of the businesses used an IBM PC or compatible. The normal configuration (used by half of the businesses) was a dot matrix printer, an IBM AT or compatible with one floppy disc drive, and one hard drive.

All user companies owned general application packages. Predictably, these tended to be word processing and accounting packages, which included general ledger, accounts receivable, and accounts payable. The use of spreadsheets was also relatively popular. The number of different applications being used by the businesses was small (see table 5). Eighty percent used no more than three packages with the most time spent on accounting (see table 6).

In approximately half of the user companies, top management was directly involved in the use of microcomputers (see table 7). Most of them agreed that tasks were completed much quicker, and they were entirely satisfied with the resulting benefits such as improved financial control. The need for accuracy was a major problem for users and work scheduling required a greater discipline and formal-

\*A copy of the questionnaire is available from the authors.

**Table 1**  
**AGE OF FIRM RELATED TO CURRENT STATE OF COMPUTERIZATION**

Age (years)	Computerized		Non-computerized		Total Number
	Number	Percent	Number	Percent	
1-10	13	76	4	24	17
10-20	15	58	11	42	26
> 20	9	38	15	62	24
Totals	37		30		67

**Table 2**  
**SURVEYS IN SMALL BUSINESS COMPUTERIZATION**

Researchers	Sample Size	No. of Employees	Location	Computerized
Nickell and Seado (1986)	121	fewer than 1500	Fargo-Moorhead, US	68%
Raymond (1987)	1226	20-250	Quebec, Canada	38%
Nazem (1987)	598	fewer than 100	US	52%
Griffith and Dorsman (1987)	331	fewer than 500	North West, UK	79%
Nazem (1990)	376	fewer than 100	Nebraska, US	36%
Schleich, et al. (1990)	137	fewer than 50	US	27%
This study (1991)	67	fewer than 50	Norfolk, UK	55%

ity. The impact on organizational structure and employment was considered minimal in most of the companies. However, comments from these companies confirmed some of the problems of computerization such as lack of experience and knowledge of computers and the indifference of suppliers as far as back-up service was concerned.

### The Interviews

Except for one company, all of the interviewees were managing directors or top managers in their companies. The 10 companies offered an indication of the attitudes and experiences affecting computerization in small businesses. Their work procedures and microcomputer operations were also observed.

**Table 3**  
**SOURCE OF ADVICE  
FOR MICROCOMPUTER SYSTEMS  
(n = 37)**

	Number	Percent
None	9	24
Equipment supplier	20	54
Consultants	10	27
Software supplier	10	27
Accountants	8	22
Others	2	5

**Table 4**  
**AREA IN WHICH  
ADVICE WAS SOUGHT  
(n = 28)**

	Number	Percent
Selection of software	22	79
Selection of hardware	20	71
Staff training	8	29
If the organization needs a microcomputer	5	18
Company/job reorganization	2	7
Others	2	7

**Table 5**  
**NUMBER AND TYPE OF APPLICATION PACKAGES USED**

Number of Application Packages	Number of Companies	Percent	Application Packages Used	Number of Companies	Percent
1	8	22	W/P only	3	8
			A/C only	4	11
			CAD only	1	3
2	10	27	W/P & A/C	6	17
			S/S & A/C	2	5
			W/P & S/S	2	5
3	12	32	W/P, DBMS & S/S	3	8
			W/P, S/S & A/C	7	19
			W/P, A/C & DTP	2	5
4	5	13	W/P, DBMS, S/S & A/C	4	10
			W/P, S/S, A/C & CAD	1	3
5	1	3	W/P, DBMS, S/S, CAD & DTP	1	3
6	1	3	W/P, DBMS, S/S, A/C, CAD & DTP	1	3
Totals	37	100	Totals	37	100
W/P - Word processing			DBMS - Database management system		
S/S - Spreadsheet			A/C - Accounting		
CAD - Computer assisted design			DTP - Desktop publishing		

**Table 6**  
**MOST IMPORTANT APPLICATIONS USED AND THOSE TAKING UP MOST TIME**  
**(n = 37)**

Application	Most Important Applications		Applications Taking The Most Time	
	Number	Percent	Number	Percent
Accounting	23	62	21	57
Word processing	12	32	6	16
Spreadsheet	5	18	2	5
Database management system	1	3	1	3
Graphics & CAD	3	8	3	8
No answer	3	8	4	11

Managers at companies which had not installed microcomputer systems cited the size and the special characteristics of their company and the sufficiency of the manual system as major reasons why these companies did not consider installing a computer system. They believed

that the use of computer systems would not reduce costs and staff. Some of them argued that a computer system could not be as efficient as a manual system.

At the companies which had installed a microcomputer system, most of the interviewees implied that the satisfactory

**Table 7**  
**THE PERSON MOST INVOLVED WITH THE**  
**USE OF COMPUTER SYSTEMS**  
**(n = 37)**

	Number	Percent
Manager director/ top manager	18	49
Secretary	12	32
Accounting clerk	9	24
Designer/engineer	3	8
All staff	5	14

use of computer systems was related to their experience and the computer knowledge of users. One of the companies was having difficulties with its networked microcomputer system and the software and hardware suppliers. Most companies confirmed that benefits were achieved for accounting and financial control, production control, or the good image of the company. After observing operations and work flow, it was found that microcomputer systems were often functioning below their full capacities. Microcomputer systems were mostly operated by top managers in these companies. This meant that the range of people familiar with microcomputer systems in small businesses was limited. Security and training expenditure considerations appeared to be the reasons why top management was involved in most computer operations. One company did, however, encourage staff to operate the computer systems as a support tool for their work. The training was very important in this case. As a general rule, interviewees suggested that the most successful approach to implementation was to buy quality application packages from a well-known supplier and adjust the company system to fit the package. Buying hardware from a well-known supplier which provided a good maintenance service was also recommended by several interviewees.

A number of interesting findings have arisen out of the study. These may be the result of regional factors; others either have not appeared in the literature or may have been ignored by previous researchers. They may be summarized as follows:

*Company age.* It seems that the long-established companies are more reluctant to use microcomputer systems than the newer companies in this study.

*Category.* There was no evidence found of a relationship between the categories of business and whether or not these companies implemented a microcomputer system in this study.

*Equipment supplier.* Small businesses seemed to be more reliant on equipment suppliers than application suppliers, accountants, or others. It might imply that the selection and problems of microcomputer systems are based on hardware rather than focusing on software or the organization.

*Users.* More than half of the questionnaire respondents indicated that the users were top managers. Four out of five interviewees stated the major microcomputer users in their companies were top managers.

*Macintosh.* No company used Macintosh computers in this study. For an inexperienced computer user, there seemed to be little difference between an IBM PC and a Macintosh. Although training and ease of use seem to be important characteristics with respect to the Macintosh, it appears that low entry cost and the existing widespread use of the IBM PC override these factors.

*Accounting packages.* Accounting was the most important and widely used software in the small businesses studied. It suggests that either small business owners recognize the importance of accountability or the need to facilitate dealings with governments and banks.

*Definition of small business and research agenda.* Lack of a precise defini-

tion and agenda for small business research makes small business study difficult. Almost all of the researchers in the small business area have tried to define small businesses appropriately. Most continue to consider or adopt only quantitative criteria. The use of contextual qualitative data such as market role and economic importance remains challenging.

### Conclusions

This study supports the view that microcomputers are primarily used for basic and operational purposes rather than decisional purposes. Evidence for this is the dominant use of accounting and word processing software. Confusion about the definition of small businesses is significant in the sense that small in the United States tends to be larger than small in the United Kingdom. This is because a legal definition of small company (anchored on fewer than 50 employees) exists in Europe. At this size, characteristics of companies tend to be dominated by one or two owner-managers who retain large amounts of information and make decisions in their own minds (Mackness 1975). This may also explain why these companies tend not to operate formal (computer-based) decisional systems.

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