THE APPLICATION OF NEW TECHNOLOGY IN THE PAKISTAN BANKING INDUSTRY

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The purpose of this study was to identify the areas where new technology was being applied in the Pakistan banking industry. The study mainly involved an investigation of three issues: the banking activities so far computerized, the extent of new technology at different worksites and the possible reasons for the introduction of new technology equipment. This paper will concentrate on the managerial perceptions relating to applications of new technology. During this study, 210 bank managers working in four sample commercial banks; Habib Bank Ltd. (HBL), Muslim Commercial Bank Ltd.(MCB), National Bank of Pakistan (NBP) and United Bank Ltd. (UBL) participated. The results of this study suggested that certain worksites; head offices and branch offices tended to be computerized while no computers were used at circle and zonal offices. Our data indicated that the level of new technology was higher at head offices than that at branch offices. While the Habib Bank emerged to be the first and tended to computerise more banking activities followed by the other sample banks. The results of our study also reflected the statistically significant relationship between the size of the work place and the number of computerized areas.

In the late 1960s, the banking industry in Pakistan began to introduce computers. Activities which were computerized ranged from current Deposit and Profit and Loss Accounts to Advances, Personnel files and Balance sheets. There was a growing demand for customers' services, the industry has enjoyed a high and growing demand which allows continuous working throughout the year. Factors

such as domestic and international competition have accelerated the pace of computerization. However, the utilization of computers has been mainly restricted to the big cities of Pakistan which include Karachi (the country's biggest city and business centre where the head offices of all the sample banks are located) followed by Islamabad, Lahore where 76 percent of the total computers are located while the remaining 24 percent are located in other cities namely, Quetta, Hyderabad, Sukkur, Sargodha, Multan, Faisalabad, Rawalpindi and Peshawar (Khowaja, 1986). The computerization process of the banking sector remains on the agenda of banks and will continue to do so throughout the country.

RESEARCH METHODOLOGY

Subjects

The management sample includes 210 managers drawn from four commercial banks in Pakistan HBL (n=46), MCB(n=55), NBP(n=50) and UBL(n=59) located at Karachi and Hyderabad participated in the present study.

The sample size according to work sites includes five divisions at head office, one circle office, one regional office (except NBP where the circle office and regional office is one and the same) and ten branches from each bank. According to size (number of employees) of the worksites included in the sample, almost equal number of the subjects were drawn from the size ranging from 0-19, 20-49, 50-99, 100 to 499. The total management sample comprised of four sub-samples according to work sites which included Head office (n=81), Circle office (n=15), Zonal office (n=9) and Branch office (n=105). According to hierarchy level, Board Member accounted for (1.2%), top management (24.7%), middle management (23.5%), jun-

ior management (24.7%) and finally supervisory management (25.9%) of the head office management sample. The circle office management sample included three hierarchy levels of management (i.e.Top,middle and supervisory management) and five managers were drawn from each hierarchical level. The Regional office management sub-sample also included three levels of management similar to circle office management.Finally the branch management sub-sample included both branch managers and supervisory management almost equally.

Operational Measure

During this study, questionnaire survey method was adopted. Various researchers have emphasized the significance of the questionnaire technique as a potential research tool in social research (Ary et al. 1972, Barttran, 1973, Clover & Balsley, 1979, Mason & Bramble, 1978, and Sellitz et. al. 1966). A 31-item question was designed to identify the areas of applications for new technology which was initially based on the survey report on computer facilities by the Pakistan Computer Bureau (1984) and subsequently refined during the pilot study: some banking activities were included which were probably computerized in late 1980s. Another question was designed to measure the level of new technology at different workplaces.Obviously answering most of the questions required a subjective judgement which the respond-ents (managers) gave on three-point scale low, medium and high). A separate question explored the perceived reasons for introducing new technology.The selection of items was mainly based on the study by Davies(1986)with certain changes and a different 5-point scale was developed to answer this question ranging from very important to very unimportant.In addition,the benefits of new technology identified

by Lewis(1985)were also used as possible reasons for introduction of new technology.

Statistical Analysis of Data

The data were analysed through the use of Computer programmes available in the SPSSx (Statistical Package for Social Sciences) Package. The data were given statistical treatment through descriptive statistics, mean & S.D and cross-tabulation. Significantly, frequency distribution of each variable was found out. The mean and S.D. was computed and cross-tabulation technique was performed on data to examine differences between means of four sample banks by using the chi-square test.

RESULTS

1. AREAS OF APPLICATIONS FOR NEW TECHNOLOGY

A 31-item question was asked to investigate the areas of application for new technology which may have been computerized in the four banks under study (mainly head office and branch office). All the managers in the sample answered this question and the results summarized below reflect their mean responses in each bank.

An inspection of Table-1 shows that computerization has been the strongest in sixteen out of thirty one banking activities; Saving/Profit and Loss Accounting, Current Deposit Accounting, Inter-branch Reconciliation, Advances, Personnel Information, Pay, Staff Loans, Provident Fund, Increments and Promotions, Hajj. [1] Application Accounting, Home remittance, Profit and Loss and Balance Sheet, Zakat [2] Committee Accounting, Deposits/ Advances Position of Branches and the School/Credit banking respectively. In contrast, more respondents ob-

served no computerization of the remaining fourteen areas (except one-weekly position/scheduled telegrams-where positive and negative responses were evenly distributed). In the latter cases, responses of 'no computerization' do not suggest that these areas have not been automated at all but either that these areas have been computerized at a lower level or in fewer workplaces. Another factor is a considerable number of managers who in fact worked at the workplaces which used computers but they were not involved themselves in actual computer operations. Therefore, these managers either did not respond to this question or thought irrelevant to them.

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[1] Hajj: the fifth pillar and one of the finest institutions of Islam is the Hajj or pilgrimage to Mecca. The performance of Hajj is obligatory, at least once in a lifetime, upon every muslim. (p.99)

[2] Zakah: (Zakat) literally means purity. The technical meaning of word designates the annual amount in kind or coin which a muslim with means must distribute among the rightful beneficiaries (the poor and those in need). (p.95)

SOURCE: Hammudah, A.(1975) Islam in Focus.

TABLE -1
SHOWING AREAS OF APPLICATIONS FOR NEW TECHNOLOGY
Numbers (percentages)

Area	Yes	No	N/A* at this level	Not answered	Total
1. Current Deposit Accounting	136 (64.8)	19 (9.0)	38 (18.1)	17 (8.1)	210 (100.0)
2. Saving Deposit/ P/L Accounting	157 (74.8)	2 (1.0)	36 (17.1)	15 (7.1)	210 (100.0)
3. Non-Resident Accounts	78 (37.2)	32 (15.2)	71 (33.8)	29 (13.8)	210 (100.0)
4. Advances	90 (42.9)	61 (29.0)	37 (17.6)	22 (10.5)	210 (100.0)
5. Fixed Term Deposits	60 (28.5)	80 (38.1)	44 (21.0)	26 (12.4)	210 (100.0)
6. Weekly Position/ telegrams	69 (32.9)	69 (32.9)	50 (23.8)	22 (10.4)	210 (100.0)
7. Home Remittance	67 (31.9)	51 (24.3)	59 (28.1)	33 (15.7)	210 (100.0)
8. School banking/ Credit banking	41 (19.5)	34 (16.2)	97 (46.2)	38 (18.1)	210 (100.0)
9. Hajj application Accounting	72 (34.3)	50 (23.8)	57 (27.1)	31 (14.8)	210 (100.0)
10. Zakat Committee accounting	60 (28.5)	44 (21.0)	65 (31.0)	41 (19.5)	210 (100.0)
11. Inter-branch reconciliation	124 (59.0)	15 (7.1)	44 (21.0)	27 (12.9)	210 (100.0)
12. Personnel Information	47 (22.4)	17 (8.0)	39 (18.6)	107 (51.0)	210 (100.0)
13. Staff pay	91 (43.3)	56 (26.7)	40 (19.0)	23 (11.0)	210 (100.0)
14. Staff loans	90 (42.9)	50 (23.8)	43 (20.5)	27 (12.8)	210 (100.0)
15. Provident Fund	102 (48.5)	26 (12.4)	59 (28.1)	23 (11.0)	210 (100.0)
16. Increments	56 (26.7)	33 (15.7)	92 (43.8)	29 (13.8)	210 (100.0)
17. Promotions	40 (19.0)	28 (13.3)	107 (51.0)	35 (16.7)	210 (100.0)
18. Income Tax/ legal expenses	37 (17.6)	67 (31.9)	66 (31.5)	40 (19.0)	210 (100.0)

TABLE: 1 continued

Areas	Yes	No	N/A* at this level	Not answered	Total
19. Rent/Lease/ billing and Collection	30 (14.2)	56 (26.7)	80 (38.1)	44 (21.0)	210 (100.0)
20. Share/store accounts	26 (12.4)	59 (28.1)	91 (43.3)	34 (16.2)	210 (100.0)
21. Local/foreign demand draft.	24 11.4)	96 (45.7)	51 (24.3)	39 (18.6)	210 (100.0)
22. General banking/test key.	35 (16.7)	88 (41.9)	55 (26.2)	32 (15.2)	210 (100.0)
23. Investments	23 (11.0)	40 (19.0)	105 (50.0)	42 (20.0)	210 (100.0)
24. Profit and loss & balance sheet.	66 (31.5)	61 (29.0)	54 (25.7)	29 (13.8)	210 (100.0)
25. Position of deposits/advances of branches.	53 (25.2)	48 (22.9)	79 (37.6)	30 (14.3)	210 (100.0)
26. Furniture and fittings.	26 (12.4)	92 (43.8)	54 (25.7)	38 (18.1)	210 (100.0)
27. Job accounting.	23 (11.0)	85 (40.5)	62 (29.5)	40 (19.0)	210 (100.0)
28. Consortium and financing.	25 (11.9)	41 (19.5)	107 (51.0)	37 (17.6)	210 (100.0)
29. Printing of cheques.	27 (12.9)	21 (10.0)	122 (58.1)	40 (19.0)	210 (100.0)
30. Agricultural/ small loans.	62 (29.5)	67 (31.9)	54 (25.7)	27 (12.9)	210 (100.0)
31. Income and expenses.	58 (27.7)	70 (33.3)	53 (25.2)	29 (13.8)	210 (100.0)
Average percentage	**(29.6)**	**(23.9)**	**(30.3)**	**(16.2)**	**(100.0)**

* Mainly managers at regional and circle offices and those who were not involved themselves in the computer operations.

1.1 The Extent Of New Technology In Banks

The extent of the application of new technology was found to be different among the four banks under study. As illustrated in Table-2, the Habib Bank Limited has a higher mean score of application areas (mean=11.02) which in turn suggests that a wider range of areas have been computerized. This partly reflects the fact that the Habib Bank was the first which introduced computers for handling their increasing volume of transactions and was later followed by other banks (See Section 1.4 below). In terms of the range of new technology applications, the National Bank stands second, the Muslim Commercial Bank third and finally the United Bank. However, the overall difference is not statistically significant (chi-square=10.13, df=6, P<0.12). The high standard deviation indicates the considerable variation between individual managers at various workplaces.

TABLE 2

SHOWING RANGE OF NEW TECHNOLOGY APPLICATION IN THE SAMPLE BANKS (MAXIMUM-31 APPLICATION AREAS)

Name of bank	Range of new technology Applications		No.of managers
	Mean	S.D	
1. Habib Bank Limited	11.02	8.69	46
2. Muslim Commercial Bank	8.64	8.89	55
3. National Bank of Pakistan	9.28	6.43	50
4. United Bank Limited	7.61	6.20	59

Thus it could be concluded that; the earlier the introduction of computers, the more areas have tended to be computerized.

1.2 The Impact of Size on the Extent of New Technology

There appears to be considerable effect of the size of the workplace on the extent of new technology. An inspection of Table-3, reveals that the larger the workplace size, the higher will the range of application for new technology be. Smaller workplaces had a lower mean (mean=6.91), than medium size workplaces (mean=8.42) and larger workplaces (mean=14.09). This difference was highly statistically significant (chi-square=27.50, df=4, P<.001).

TABLE - 3
SHOWING SIZE OF WORKSITES AND THE EXTENT OF NEW TECHNOLOGY
(n = 176)

Size of worksite (No.of employees)	No.of areas subject to new technology Mean	S.D.	No. of managers
1. Small (0-49)	6.91	6.60	86
2. Medium (50-99)	8.42	7.12	36
3. Large (100 and above)	14.09	7.84	54

1.3 Impact of the Age of New Technology on its Extent

Among the four sample banks, the Habib Bank emerged to be the first to introduce the computers for automating their banking activities. This fact was substantiated by an additional question. In this respect, 44.4 percent of the HBL managers indicated that the Habib Bank started computerization of banking activities in the 1960s compared to 23.3% who indicated the 1970s, 30 percent the 1970s and 13 percent indicated the 1980s for computerization of their banking business. In the case of the Muslim Commercial Bank 18.6 percent of this bank's sample considered the introduction of computers in the 1960s, 16.7

percent in the 1970s and 34.4 percent in the 1980s. Finally, of the United Bank's managers, 11.6 believed that computerization started in the 1960s, 30 percent in the 1970s and 44.3% suggested the 1980s.

A significant relationship was evident in terms of the longer the development of computerization, the more banking activities tended to be automated. For example, banks where computers were installed in the late-sixties demonstrated a higher mean (mean=16.00) than those where computers have been introduced in the 1970s and 1980s (mean=8.67 and mean=7.48) respectively as illustrated in Table 4. This relationship was very highly statistically significant(chi-square=37.07, df=4, P<.001).

TABLE - 4

SHOWING AGE OF NEW TECHNOLOGY AND ITS EXTENT (n=134)

Age of N.T.	Number of new technology applications (maximum=31)		No.of managers
	Mean	S.D.	
1. Well established (1960s)	16.00	9.48	43
2. Less established (1970s)	8.67	6.68	30
3. Newly established (1980s)	7.48	4.83	61

1.4 Worksites And The Level Of New Technology

A four-item question was asked in order to assess the perceived level of new technology at different worksites; the head office, circle office, zonal office and branch office. An examination of Table-5 indicates that a majority of the managers thought the level of new technology to be high at head office and low or medium at branch level. Although circle and zonal/regional offices were included

in the sample keeping in view the organizational structure of the banks, they were subsequently excluded from the analysis as no computers had been installed at these levels.

TABLE - 5

SHOWING "HOW WOULD YOU RANK THE LEVEL OF NEW TECHNOLOGY IN YOUR BANK AT DIFFERENT WORKSITES?"
(n=178-179) Numbers (percentages)

Worksites	Level of new technology			No.of managers
	Low	Medium	High	
1. Head office	24 (13.4)	75 (41.9)	80 (44.7)	179 (100.0)
2. Branch office	76 (42.7)	82 (46.1)	20 (11.2)	178 (100.0)

Table-6 reports mean scores of areas of application for technology. This shows a higher mean score of application areas at head office(mean=10.84) and lower at branch level (mean=8.38). This relationship is also statistically significant(chi-square=20.59, df=6, P<.01). These results appear to be logical in the sense that all the sample banks started computers at their head offices and only later were these introduced in the branches as revealed during this survey

TABLE - 6
SHOWING WORKSITES & THE EXTENT OF NEW TECHNOLOGY
(Max = 31)

Worksites	No.of areas of application for N.T.		No.of managers
	Mean	S.D	
1. Head office	10.84	9.62	81
2. Branch office	8.38	5.26	105

2. REASONS FOR INTRODUCING NEW TECHNOLOGY

A number of possible reasons behind the introduction of new technology were investigated. All these reasons were generated from the literature and particularly the study by Davies (1986). The participating managers were asked to rank the importance of these reasons for the introduction of new technology equipment on the basis of a 5-point scale (ranging from very important to very unimportant). These reasons can be divided into three groups and consisted of the following:

1) Manpower Issues

a) to improve working conditions,
b) to increase control over subordinate staff.

2) Production Issues

a) to improve office productivity,
b) to improve quality of customer services,
c) to cope with an increased volume of activity.

3) Economic Issues

a) to reduce labour costs,
b) to compete with other banks,
c) government legislation (e.g. import policy of computers),
d) the cost of the equipment.

2.1 Manpower Reasons

The two reasons investigated in this category were the improvement in working conditions and the increase of control over subordinate staff. More than 88 percent of the respondents perceived that the first reason was either

important or very important; while more than half (57%) of the managers recognized the importance of the later reason for the introduction of new technology. In relation to 'increasing control over subordinate staff', no significant difference of opinion was observed among all the sample banks (chi-square=13.80, df=12, P<.32), while in the case of improvement of working conditions, a statistically significant difference among the banks was found (chi-square=21.97, df=12, P<.05). The Muslim Commercial Bank managers assigned more importance to this reason than managers working in other banks as main factor behind the introduction of new technology equipment in their bank.

2.2 Production Reasons

Fairly high percentages for all the production reasons were obtained as reflected in Table-7. In relation to these production reasons; improvement in office productivity, improvement in quality of customer services and coping with an increased volume of work, almost nine of ten respondents indicated that each of these was an important factor for introducing new technology equipment. The reasons given by the managers of the four banks were similar except the one relating to coping with an increased volume of activity which was found to be perceived significantly different (chi-square=15.20, df=6, P<.01). The Muslim Commercial Bank managers and United Bank managers attached more importance to this than their counterparts in the other two banks as a factor for introducing new technology equipment in their banks.

2.3 Economic Reasons

As regard to economic reasons, 'competition' with

other banks emerged to be the most important factor for introducing new technology equipment as perceived by 85 percent of the participating managers and three-fifths of the managers observed 'reduction of labour costs' as an important reason for the introduction of new technology. Two other reasons which related to the liberal policy of the government regarding the 'import of computers' and the 'cost of the equipment' were considered as important factors but were less emphasized as important reasons for introducing the new technology equipment. All the economic reasons given by the managers across the four sample banks were quite similar except for the 'cost of equipment' where a statistically significant difference was shown among the banks (chi-square=27.69, df=12, P<.01). In this respect, the MCB and HBL managers thought this reason more important than their counterparts in other banks for the introduction of new technology in their respective banks.

TABLE: 7

SHOWING THE OPINION AS TO HOW IMPORTANT WERE THE FACTORS AS REASONS TO INTRODUCE NEW TECHNOLOGY EQUIPMENT" (n=210) Numbers (percentages)

Reasons	Important	Un-important	Neither Import: nor un-import	Missing	Total
MANPOWER:					
(i) Improve working conditions.	186 (88.6)	6 (2.9)	16 (7.5)	2 (1.0)	210 (100.0)
(ii) to increase control on subordinate staff.	121 (57.6)	28 (13.2)	46 (21.9)	15 (7.3)	210 (100.0)
PRODUCTION:					
(i) to improve office productivity.	188 (89.5)	3 (1.4)	14 (6.7)	5 (2.4)	210 (100.0)
(ii) to improve quality of customer services.	192 (91.4)	2 (1.0)	6 (2.9)	10 (4.7)	210 (100.0)
(iii) to cope with increased valume of work.	191 (90.9)	- -	10 (4.8)	9 (4.3)	210 (100.0)
ECONOMIC:					
(i) to reduce labour costs.	129 (61.4)	27 (12.9)	33 (15.7)	21 (10.0)	210 (100.0)
(ii) to compete with other banks	180 (85.7)	7 (3.3)	12 (5.7)	11 (5.3)	210 (100.0)
(iii) Government legislation (import of computers)	74 (35.3)	27 (12.8)	33 (15.7)	76 (36.2)	210 (100.0)
(iv) the cost of the equipment.	99 (47.1)	30 (14.3)	31 (14.8)	50 (23.8)	210 (100.0)

SUMMARY AND CONCLUSION

In this study, an attempt has been made to identify the areas of application for new technology, that is banking activities which have been computerized to date in the Pakistan banking industry. It was revealed that certain worksites; head offices and branch offices have been computerized while no computers were used at circle and regional/zonal offices. Our data indicated that the level of new technology was higher at head offices than at branch offices. These results appear to be consistent with the bank's general policy of introducing the new technology equipment firstly at head office and thereafter at branch level. The rationale for not using computers at circle office and zonal office seems to be in line with the co-ordinating nature of their activities between branches and head offices and the fact that they do not provide any direct services to the customers. Our study indicates that within the four sample banks, the Habib Bank was the first to computerize their banking activities, followed by the National Bank, the Muslim Commercial Bank, and the United Bank. It was also revealed that those banks which introduced computers earlier, tended to have computerized more banking activities: the Habib Bank led the other banks in terms of the number of computerized activities, followed by the National Bank, the Muslim Commercial Bank and the United Bank. The results of our study also reflected the statistically significant relationship between the size of the workplace and number of computerized areas. In addition, factors such as manpower, production and economic were found to be perceived as important reasons behind the computerization of the banking sector in Pakistan. However, two economic factors; cost of the equipment and the government import policy of computers were less emphasized than expected. This may in part reflect a lack of knowledge about the import policy on computers and

the cost of the equipment which remains limited to a few concerned managers (particularly at head office computer divisions) who are responsible for such matters. A similarity of opinion was found on various reasons for the introduction of new technology across the bank managers. The overall pattern of agreement among the managers of the four banks under study was remarkable. Even where a significant difference was found across the bank's managers, it was in terms of degree of emphasis rather than contrasting perceptions.

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