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INFORMATION TECHNOLOGY SYSTEMS AND THEIR IMPACT ON THE EMPLOYMENT LEVEL IN THE POLISH BANKING SECTOR

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Abstract. The issues of techniques and technology are frequently discussed in economic literature. A variety of professional terminology, language phrases and sometimes neologisms functioning in practice and professional literature of the subject indicate the importance of techniques and technology for the banking activities. One of the aspects of techniques and technology are information technology (IT) systems supporting human resource (HR) management and operation information technology systems. The purpose of this article is to present, analyze and evaluate the impact of information technology systems on the level and structure of employment in the Polish banks. The author's intention is to support the thesis that application of information technology systems in the Polish banking systems has caused a significant change in the level and structure of employment. In the analysis, the usage of the IT systems supporting human resource management has been depicted in order to finally be able to evaluate the impact of the IT systems on the level and structure of employment in banks.

Keywords: Banks, Eelectronic Banking, Employment, Labour and Employment, Communication Networks, Communication Systems, Technology.

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1. Introduction

The issues of techniques and technology[1] are frequently discussed in economic literature. Attention is often drawn to the strength and even non-reversibility of changes which take place in this field. As exemplified by T. Białobłocki, J. Moroz "Rushing machine of technological progress cannot be stopped…" (Białobłocki & Moroz, 2006). J. D. Sachs is of the opinion that "…we live in the network age..." (Sachs, 2008). A lot has been written about "technological revolution" (Parysek, 2008). Similar opinions may be found both among economists, sociologists, political scientists as well as among other representatives of the scientific circles and economic practitioners.

A variety of professional terminology, language phrases and sometimes neologisms functioning in practice and professional literature of the subject indicate the importance of techniques and technology for the banking activities. Economic processes and also technical and technological progress have reached such a pace that in practice almost nobody is now able to be well informed about techniques and

[1] It is assumed that technology is "a part of human activity which purpose is to use knowledge (science), to produce things, create phenomena which do not exist in nature and transform nature; major factor of civilization development and, together with science, significant part of human culture. T. is called also a way and fluency of doing certain things in particular field, e.g. playing a musical instrument, t. in football, t. in mental work" Technology is "a part of technique dealing with preparation and application of production and processing procedures which are most convenient in given conditions; e.g. t. chem. biolog. (biotechnology), mechanical technology (changes of materials' shape and look caused by mechanical actions e.g. welding, casting); depending on the final products: t. paper, gum, machine construction" [http://encyklopedia.pwn.pl, as of 12.1.2011]; from now on the author will treat techniques and technology as one employment determinant.

technology *sensu largo*. One of the aspects of techniques and technology are information technology (IT) systems supporting human resource (HR) management and operation information technology systems. The purpose of this article is to present, analyze and evaluate the impact of information technology systems on the level and structure of employment in the Polish banks.

The main sources used in the article are as follows:
- professional literature,
- reports, strategy papers, prospectuses and other documents published by banks and supporting institutions,
- results of a survey conducted among banks' staff employed in the Wielkopolska region,
- results of direct interviews with nine (not randomly selected) human resource staff members and members of the management boards of two banks operating in the Wielkopolska region.

Questionnaires and interviews were conducted in[2] 2009 and 2010. Two types of anonymous questionnaires were used depending on the position the surveyed occupied in the company, i.e. managerial or non managerial one, the surveyed were asked to fill in an adequate, anonymous questionnaire.

The author's intention is to support the thesis that application of information technology systems in the Polish banking systems has caused a significant change in the level and structure of employment. In the analysis, the usage of the IT systems supporting human resource management has been depicted in order to finally be able to evaluate the impact of the IT systems on the level and structure of employment in banks. The author aimed to confirm the thesis that the use of the IT systems in the Polish banking sector caused changes in the level and structure of employment. The use of supporting staff management systems and operation technology systems is presented to be subsequently able to assess the impact of the IT systems on the level and structure of employment in banks.

2. Information Technology Systems Supporting Staff Management and Operation Information Technology Systems in Theory

One of the technological solutions directly relating to the employment sphere are information technology systems supporting human resource management. They encompass primarily HR databases and more advanced programs of staff management. The aforementioned programs may be applied to each step of the contact with employees starting with recruitment, selection, through employment, evaluation, courses and vocational training (Staniewski 2008) of employees and finally finishing the employment span.

As far as recruitment and selection are concerned, the programs supporting staff management collect and classify information on employees. Due to its use, the recruitment process may be completed much easier and faster since they facilitate selection of applicants fulfilling certain criteria (e.g. education) among hundreds and sometimes thousands of applications which stockpiled over a longer period. Banks' human resources databases usually are centrally located in the organizational structure that effectively streamlines organisational procedures in banks and makes it easier to share information with bank branches and divisions (e.g. when a bank has regional HR centers), and makes it possible for the organisation's headquar-

[2] The questionnaire-based survey was conducted because of the lack of any statistical data other than aggregated data for the whole financial sector. Official correspondence, e-mails and phone calls with the Central Statistical Office (GUS), Polish Financial Supervision Authority (KNF), National Bank of Poland (NBP) and Polish Bank Association (ZBP) show that the institutions do not gather detailed data on employment in the sector. Pilot research was conducted in the last quarter of 2009. First, 93 students of the Poznań University of Economics were asked to fill in the questionnaire. Their comments and suggestions concerning construction of the questionnaire were taken into account and the improved questionnaire was distributed among 37 bank employees (both in the region of Wielkopolska, Lubuskie, Dolnośląskie, Pomorskie and Łódzkie). Guidelines received from the employees were again used to improve the questionnaires. The minimum sample size was taken from the equation n = ualfa^2/(4*d^2), for: estimation error d = 0,05; 1-alfa = 0,9; ualfa = 1,64. [Szuman 2008, p57-59]. The minimum sample size was 269. During the research a snowball technique was used. Answers were received from 342 bank employees (out of which 17 were rejected due to their low reliability and credibility). Finally, 266 questionnaires were collected from non-management employees and 59 from managers. It should be emphasized that the banks which employees took part in the survey account for over 90% of the total banking sector assets in Poland and employ over 74% of all banking sector employees in the country. Due to its superior position over the rest of the banks, the NBP was not covered by the survey. The questionnaire encompasses the period of 1996-2008 although employees also referred to the changes that took place after 2008. Opinions provided by the surveyed later were analyzed and divided into 32 categories: employees of commercial/cooperative/foreign banks; employees of big banks (according to a classification created by the Polish Financial Supervision Authority, assets of these banks are above PLN 50 mio. [*Raport o sytuacji banków w 2009 roku*, p23]): PKO, Pekao, BRE, ING Bank Śląski, BZ WBK, BGK; „McBanks" employees; women/men; employees working in a bank under 1 year, 1-3years/4-6years/7-17 years/above 12 years; employees of banks which were or were not merged, employees of banks where equity belongs or not to foreign investor; employees of banks that were privatized/ employees of banks which from the beginning were in private hands and thus could not be privatized/ bank which were not fully privatized and remain (at least 50%) state owned; employees of headquarters/regional branches/small branches with up to 6 employees/medium-size branch with 7-20 employees/ big branches with over 20 employees/ franchise units; employees working in Poznań/outside Poznań; managers of the lower/medium/high level.

ters to manage bank's HR department. Today's tendency to introduce new techniques, increased informatization and networking (Zacher 2007) extensive application of information technologies in banking processes, or at least their selected elements seems to be a necessary condition for HR services to be managed by a headquater.

Undoubtedly, operation information technology systems influence the level and employment structure in the banking sector. Often introduction of such systems in banks was expected to make information management more centralized. New the IT solutions favored transferring non-sales units to bank central offices or regional branches. More and more widespread application of the IT tools in the Polish banks brought about reduction in back office force and an increase in the level of front office workers (Czapelska 2004). Growing centralisation turned other units into sales centres (Harasim 2005). And now people working in the sales units are able to contact credit centres which have been taking decisions via the IT systems.

The situation results in increasing work specialization due to which employees become specialists in relatively narrow fields, what in turn creates the necessity of creating teams of specialists in various fields who together are capable of running wider projects. On the other hand, it should be noticed that techniques affect perception, thinking, aims and methods of project execution. Technology imposes new work relations and hampers creation of long lasting personal relations at work. Thus, work is losing its "collective identity" (Zacher 2007). Specialized workers concentrate on their narrow part of executed work and often co-operate with information network rather than a concrete colleague.

As P. Mudie and A. Cottam point out, informatization and centralization which causes unification of procedures usually go along with a decrease of employee activity (Bąkowska & Balcerzyk 2008). Informatization causes the increase of control over employee. Sometimes the moment a worker logs into the IT system is seen as a proof of starting work; more frequently gets under the rules that apply to physical work (Jemielniak 2008).

3. Information Technology Systems Supporting Staff Management and Operation Information Technology Systems in Practice

Data shows that a number of banks in Poland decided to implement the IT-based HR systems. The bank *Zachodni Wielkopolski Bank Kredytowy (BZ WBK)* which decided to implement one of the most popular systems of the kind – SAP HR – has been using the system to manage the bank's training information service (*Raport roczny 2004*, Bank Zachodni WBK S.A.) and since 2004 also its central personnel and payroll register (*Sprawozdanie Zarządu z działalności Grupy Kapitałowej Banku Zachodniego WBK S.A. w 2004 roku)*. It took the bank several years to fully implement the system and the process was finished in 2008 (*Sprawozdanie Zarządu z działalności Banku Zachodniego WBK S.A. w 2004 roku)*. Now the employees have access to their personal HR, salary and training data through interactive online e-HR platform (*Raport roczny 2008*, Bank Zachodni WBK S.A.). *Internationale Nederlanden Groep Bank Śląski* (ING Bank Śląski) created the HR platform in 2005. Its major task was to help the employees from reorganized departments find work in different units of the bank (*Sprawozdanie z działalności ING Banku Śląskiego S.A. w 2005 roku)*. Administration, HR and payroll procedures were streamlined by means of the system in Pekao as well (*Sprawozdanie z działalności Banku Pekao S.A. za 2008 r.)*. In turn, the SAP system implemented in 2006 by *Bank Przemysłowo-Handlowy* (BPH) helped the institution introduce internal electronic document management system (*Sprawozdanie z działalności Grupy Banku BPH SA za rok 2007)* and document confirmation within the bank's IT system (*Sprawozdanie z działalności Banku BPH SA za rok 2006)* and "employees' development platform" which may be accessed via the Internet. Thanks to the system which was introduced by *Bank Gospodarki Żywnościowej* (BGŻ) in 2000, the institution could effectively economize on its staff-payroll policy (*Raport roczny 2000)*.

Relatively often employees of banks' branches receive clients' credit applications together with all the necessary documents, conduct the introductory analysis and forward the documents for final analysis to credit centers. Documents are sent either via electronic channels or post. Scoring systems that award points to potential debtors (*Sprawozdanie Zarządu z działalności Fortis Bank Polska S.A. w 2005 roku)* are

widespread and thus later serve for evaluation of credit standing. The aspect of centralization was launching in *Fortis Bank* in 2005. In turn, BZ WBK in 2001 opened communication center located in Środa Wielkopolska (*Sprawozdanie z działalności Grupy Kapitałowej Banku Zachodniego WBK S.A. 2001)*.

Table 1. Implementation of New IT Systems in Banks in 1996-2008 (managers' opinion)

Criterium	All surveyed	A. Implemented new HR system		B. Implemented new accounting system		C. Implemented basic bank IT system		D. No new system implemented		Missing answers	
Together	59	17	28,81%	23	38,98%	29	49,15%	8	13,56%	11	18,64%
Cooperative banks	7	1	14,29%	**5**	**71,43%**	**2**	**71,43%**	1	14,29%	0	0
McBanks	4	**2**	**50%**	**2**	**50%**	**3**	**75%**	1	25%	0	0

Source: personal research.

The conducted surveys show that almost half of managerial staff concluded that in 1996-2008 their banks implemented basic IT system; 38.98% of the staff confirmed in (Table 1); almost 25% indicated acquisition of HR IT systems. Similar answers were received during the interviews with HR managers and board members. Many answers confirmed the implementation of basic IT system in the cooperative banks and McBanks. The first group may be a prove of mass change of the IT systems after previous stagnation and backwardness in this field. Introduction of information systems in McBanks seems to have a lot to do with the fact that the banks are quite young. The observations confirm results of interviews conducted with HR staff.

From the he analysis of bank reports it results that in 2002 *Kredyt Bank* (KB) implemented a centralized information system called Profile (http://www.kredytbank.pl, as of 22.1.2011). Bank ING finished implementation of a newer version of their basic bank system ICBS at the beginning of 2003 (*Sprawozdanie z działalności grupy kapitałowej ING Banku Śląskiego S.A. w 2003 roku)*. In turn, Pekao acquired a new centralized IT system (Rocket) in 2004 (installed in the bank's all subsidiaries) (*Sprawozdanie Roczne 2004*, Bank Pekao S.A.). Implementation of a central information system in bank BGŻ resulted inimmediate employment reductions in the bank's IT and accounting units (*Raport roczny 2004)*.

Moreover, the systems improved work at banks' branches by making it possible to cut cost of everyday operations; in particular they reduced salary costs (*Raport roczny 2001*, BGŻ S.A.). BPH in 1999 implemented centralized IT management system after a merger with *Powszechny Bank Kredytowy* (PBK) in 2002 and is now a leader in this regard (*Raport roczny 2006)*. In 2006 the bank implemented applications which made electronic circulation of documents and HR decisions possible (*Raport roczny 2006)*. New IT platform in Bank Millenium initiated in 2002 a process of employment rationalization in the institution (*Sprawozdanie Zarządu z działalności Banku Millennium S.A. w ciągu 12 miesięcy roku obrotowego 2002)*.

In 2005 Bank Ochrony Środowiska (BOŚ) implemented a CSI project encompassing integration of the IT solutions together with applications enabling intra-country/national payments in euro (Euro-Elixir and Euro-Sorbnet), a credit risk management system and a new version of Comp-Lex system for presentation of internal bank documents. In March 2006 a system of electronic banking for corporate customers was started. Within the emergency plan of the headquarter a plan of electronic filing system of documents in the head office was launched (*Raport roczny 2005)*.

In May 2000, bank WBK and bank BZ (*Bank Zachodni*) signed a contract to purchase an ICBS license from Fiserv (Europe) Limited to install branch systems in the banks. The aim of the introduction of the integrated, centralized IT system was to improve the merged bank management and organizational structure and consequently to better ways of providing services to the bank's clients (*Dodatkowe noty objaśniające*, *SAB-RS 2001*, Bank Zachodni WBK S.A.). The WBK was completing a B1 program, which included implementation of a new ICBS IT platform. Work organization in the branches was changed.

Due to the changes, the functions of back office were centralized and processes and the bank procedures were unified. In 2001 within the B1 programme employees of the bank's branches and the *Centrum Wsparcia Biznesu* (Business Support Center) were trained both in the area of the ICBS maintenance, and new procedure and processes. Till the end of December 2002, the bank organised weekly training sessions in three training centers and managed to train over 4.5 thousand employees. After the sessions, post-implementation complementary trainings were run in the branches. The employees could also participate in the trainings via the Intranet

Table 2. Logging to the IT Systems as a Tool of Control to Verify when an Employee Starts and Finishes Work (opinion of non management employees)

Criterium	All surveyed	A. Logging is used as a control tool		B. Logging is not used as a control tool		C. Hard to say		Missing answers	
Altogether	266	87	32,71%	**164**	**61,65%**	4	1,5%	11	4,14%
Commercial banks	178	66	37,08%	**100**	**56,18%**	4	2,25%	8	4,49%
Cooperative banks	28	4	14,29%	**23**	**82,14%**	0	0	1	3,57%
Big banks	100	45	45%	47	47%	1	1%	7	7%
Banks with a majority of national capital	61	14	22,95%	**43**	**70,49%**	1	1,64%	3	4,92%
Banks with a majority of foreign capital	149	56	37,58%	**83**	**55,7%**	2	1,34%	8	5,37%
Privatized banks	94	40	42,55%	**48**	**51,06%**	1	1,06%	5	5,32%

Source: personal research.

and turn for help to a help desk (*Sprawozdanie Zarządu z działalności Grupy Banku Zachodniego WBK S.A. w 2002 roku)*. Similar trainings were organised by the bank BGŻ in 2003 when the institution implemented a new IT system (*Raport roczny 2003)*.

The majority of the surveyed non-management employees (61.65%) have concluded that their bank is not verifying the times they log into the IT systems and is not using the data as a tool of control (Table 2). At the same time, almost 1/3 of the employees (32.71%) were of different opinion. Such supervision was more popular in commercial banks than in co-operative banks and particularly common in big banks, foreign banks and privatized ones. So it may lead to the conclusion that the bigger the bank, the more popular the corporate tools. Big banks tend to use more "mass tools" in their HR policy. Additionally, it turns out that application of such innovative solutions has a lot to do with the origin of foreign strategic capital involved in the bank. Foreign capital tends to attract implementation of this type of *know how*.

4. Impact of the Information Technology Systems on the Level and Employment Structure in the Polish Banking Sector

Employees who concluded that new IT system was implemented in their banks when surveyed assessed that the system caused primarily changes in the organizational structure (35.29% of answers). They also were of the opinion that it did not cause bigger changes in the level of employment and definitely did not contribute to its increase (Figure 1).

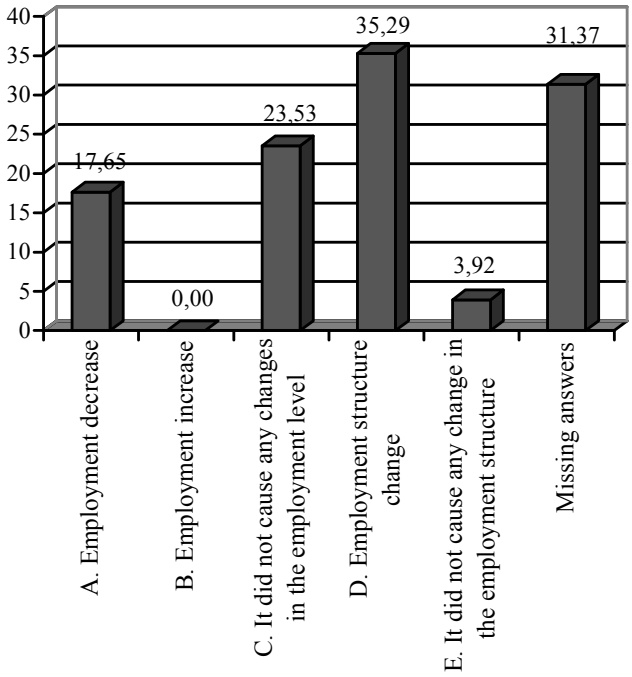

Figure 1. Consequences of the Implementation of New Information System (opinions of managers) (percentages of answers)

Source: personal research.

Banks tend to see the situation in a slightly different way and from their official reports one can see that the implementation of new IT system entails restructurization. This was the case of the bank WBK, where as a result of automatization of processes in regional branches and centralization of back office activities the demand for employee branches decreased. In order to diminish the outflow of specialist caused by the changes in work organisation, internal recruitment processes were conducted to fill vacancies within the company. Employment in the bank fell from 9764 at the end of 2001 to 9116 in December 2002 (*Sprawozdanie Zarządu z działalności Banku Zachodniego WBK S.A. w 2002 roku)*. In 2002 the bank planned to lay off 2150 people due to the introduction of the IT new system (*Raport roczny 2001*, Bank Zachodni WBK). At that time the bank declared that new organisational and technological solutions reduced operational costs of the organisation to PLN 998.1 million, i.e. cut the costs by 7.2% when compared to 2001. Salaries that constituted the major share in the cost structure decreased by 18% to the level of PLN 412.6 m (*Sprawozdanie Zarządu z działalności Banku Zachodniego WBK S.A. w 2002 roku)*.

In 2006 the ING also started to dismiss employees because of technological and operational reasons. The bank signed the agreement with its employees' trade unions (*Sprawozdanie z działalności ING Banku Śląskiego S.A. w 2005 roku)*. The bank *BOŚ* assessed that as a result of technological and organizational modernization of the bank (implementation of a centralized IT system, systems supporting management and sales as well as new organizational model), the level of employment in the institution fell by about 3% in 2011, i.e. 50 persons were dismissed despite the fact that the number of branches rose to 111 (*Prospekt Emisyjny Spółki Bank Ochrony Środowiska S.A. w Warszawie 2007)*. Similar changes resulting from technology advancement took place in the evaluated period in the majority of banks.

All in all, distribution of bank services through electronic channels brought about a decline in demand for workers in the sector. The decline varied across the field of activities undertaken by the banks. J Czapelski claims that despite the decline, the number of workers who operate the IT systems has been on the increase (Czapelska 2004). However, bank employees who took part in the survey do not tend to confirm the tendency (47.46%). Only 30.51% of the managerial staff thinks that the number of the IT workers rises (Figure 2).

One should not forget that the tendency could have been seen only in the selected areas and thus could have not been felt by all workers, e.g. as much as 52.94% of managerial staff working outside Poznań did see the trend. The trend definitely was not noticed in cooperative banks where as much as 57.14% of the surveyed did not feel the change. The lack of such signs could testify the bank's IT underdevelopment. Undoubtedly HR specialist tended to pay attention to employment levels among the peole operating the IT systems. In this field one could also see the trend for centralisation. Thus the number of the IT specialists hired by regional branches was falling as opposed to the number of people collected in regional or central specialised IT centres. HR specialists pointed out that a number of commercial banks and institutions which give credits established special *help desc*s, i.e. units which help workers whenever they signal problems with s*oftware* or *hardware*. In 2009 ING also signalled that authomatization of numerous processes caused increase in employment level (*Sprawozdanie Zarządu z działalności ING Banku Śląskiego S.A. w 2009 roku)*.

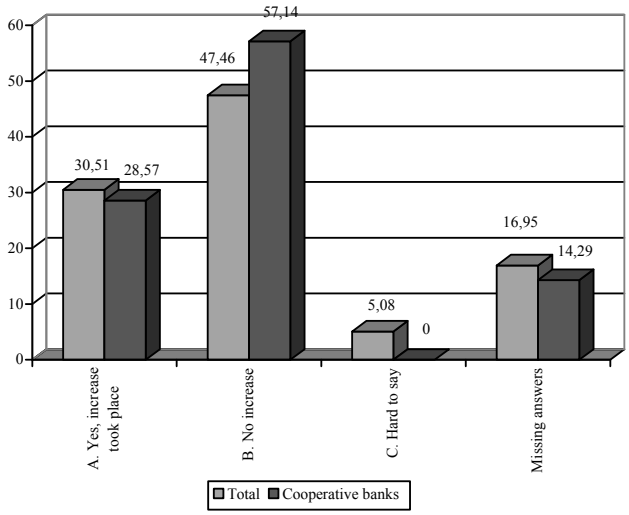

Figure 2. Increase of the Number of Employees dealing with Information Systems in 1996-2008 (opinions of managers) (in percentages of answers)

Source: personal research.

5. Conclusions

The issues of techniques and technology are frequently discussed in economic literature. One of the aspects of techniques and technology are information technology (IT) systems supporting human resource (HR) management and operation information technology systems. Information technology systems supporting human resource management made centralization of HR possible. Similar to other technical and technological determinants and their introduction forced employees to constant learning.

This process was completed with the centralization of other bank functions which was progressing because of the introduction of the IT systems. Only 13.56% of managerial staff recognised that in 1996-2008 new IT system was not implemented in their bank. Reduction of back office which resulted from the centralisaton increased specialization in the banks. They started to establish centers specializing in narrow functions, e.g. accounting. Some banks created Shared Services Centers. The fact that due to the changes work efficiency in the centres increased may be regarded as the most important achievement of the IT systems. Unfortunately, it resulted in dismissal of employees. Some of them were leaving banks and taking jobs in companies which were providing outsourcing services to the very same banks.

Significant majority of banks in Poland implements new IT systems. On the one hand, the systems are a prerequisite to conduct efficient, centralised banking operations; on the other hand, they often cause significant changes in the area of organization of activities and employment in the banks. SAP and ISBC–type systems enjoyed big popularity among the banks. However, perception of increasing informatization was viewed differently by different groups. While bank management boards perceived IT systems as a factor which increaseed effectiveness and helped cut cost, normal workers tended to pay more attention to the systems' negative influence. Undoubtedly, informatization changed employment structure in banks as it strongly centralized bank activities.

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