THE GRADUATE IN COMPUTING IN BANKING

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Abstract:

Details are given of the computing facilities within Barclays Bank, and the deployment of staff to meet the needs of a large commercial computing system is described. The ways in which graduates are employed in such an organisation are discussed, with particular reference to job satisfaction and future prospects.

The views expressed here are the speaker's own, and do not necessarily represent those of his employer, Barclays Bank.

Before discussing the ways in which graduates are employed in computing at Barclays Bank, it will be useful to give an outline of computing operations within Barclays, which is a fairly typical large commercial computer user. The main tasks of a banking computer system are to aid the transmission of information between members of the public (with any required intermediate processing), to assist with certain decision making, and to perform book-keeping. It should be emphasised that most of the bank's staff deal directly with the public, and few are displaced by the introduction of computing facilities.

The scale of the operations involved may be judged from the following table of equipment, installed in the five main computing centres:

	London	- 3 x 360/65 , 650 online terminals
	Manchester	- 2 x 360/65 , 500 " "
	Willesden	- 2 x B6700 , 200 " "
(2M/day)	Cheque clearing centre	- 12 x 360/30 and 2 x 360/50 and 1 x 360/25
	Northampton	- 2 x 360/50 and 16 MICR's

Of a total of about 60,000 staff, 471 are graduates. A department of Management Services, with a staff of over 1,300, is responsible for the administration of the computing centres, and also includes O & M. About 12 graduates are employed in a separate Operations Research group. Of the total staff of Management Services there are 82 technical staff, 149 programmers and 286 operators. Roughly 20% of the systems and programming staff are graduates.

The workload of any one of the installations typically comprises about 12 large jobs and a few smaller ones. The environment differs from that of a University in that these jobs must run on schedule and their output must be right. Examples of the work performed are branch book-keeping, BARCLAYCARD accounts, standing-order transfers, cheque clearing and share registration. Files comprising around 4 million records are needed. In more detail, the branch book-keeping program, which keeps the accounts for each branch, uses 3/4 Megabyte of core and requires, on average, 2 minutes processing per branch - a total of 5 hrs. on 4 360/65's and a B6700 each night. Input for the program is obtained from various sources (OCR, MICR etc.) during the day. Data collection is by means of a computer at each centre, linked via a very large network to the branches. New graduates tend to be unaware of the problems associated with the use of such networks, because of their size and complexity, and also the requirement that no error goes undetected.

An important facet to the work of the systems staff is to undertake feasibility studies both for new ventures and for revision of existing projects. Such studies average two man-years' effort over about four months and may result in substantial capital outlay. Three things are required of the people who are involved in making these studies: firstly, they should be able to converse with the potential users of any system in order to determine their needs, secondly, they should have adequate experience to consider the possible solutions and their costings, and thirdly, they should be

capable of contributing to the preparation of the final report. The management endeavours to pick the most suitable people for these studies, and while it has been found that graduates are soon able to satisfy the first two requirements, their report writing is abysmal. A possible reason for this is that no university curriculum includes specific training in the writing of reports, and that graduates have not had sufficient practice in this important aspect of their work. It is worth stressing that without proper documentation the technical content of the study becomes valueless.

Once the decision has been made to go ahead with a project, it is implemented by the systems and programming staff. Although they work from a broad outline, they are rigidly constrained by the original design and costing, as well as by the imposition of a well documented set of standards and techniques for producing the final system. Unlike the early days of commercial computing, this part of the work tends to be somewhat humdrum: large teams construct a system as a set of modules, the testing of which is done remotely - the glamour has gone. Some people may be surprised to learn that 50% of the programming effort is devoted to the overhead of software maintenance, which includes correction of detected errors, updating and minor development changes. This is a major burden on the bank. Most graduates do not expect to find themselves involved in this type of job, and are often dissatisfied with such work.

However, a challenge is to be found in some areas. Feasibility studies have been mentioned: there also exists a software group and a small hardware group. The software specialists advise on operating systems, programming packages, and have expertise in such fields as teleprocessing, networks, simulation and other software tools. The hardware group assesses new equipment, performs acceptance and benchmark testing, and adapts peripheral equipment, in particular, on-line terminals.

Advances have also been made in the use of management science techniques; this particularly applies to the O/R group. Examples of the work done here are survey analysis, forecasting of bank advances, extracting and summarising of information for management, modelling of business situations, staff planning, and credit assessment for the use of credit cards.

Looking at the prospects for individual advancement for the newly-recruited graduate, the situation in the Management Services department is rather different to that in the banking section. In the latter, the capable young person can see his way to advancing up the pyramid to a managerial post, or better, in a similar fashion to the Civil Service. However, in Management Services, he will find that many of the people above him are in the same age group, and his prospects do not appear to be as bright. Furthermore, with the exception of graduates having a computing science degree, his qualifications do not gain him any initial start over those who do not have a degree, in contrast again to the other departments.

A possible way to achieve advancement is to move across into the banking or business sections, but very few have done this, with the exception of the O/R scientists, who tend to develop contacts with the other sections. One reason for this unwillingness to transfer is that in some respects the effect of computers is being felt in the other sections, in that jobs at the lower levels are being taken over by automation, thus increasing contention for the higher posts.

Overall, prospects for the computing science graduate in the banking industry are fairly good, primarily in the more interesting areas. In contrast to the growing importance of these areas, namely feasibility studies, software and hardware groups, work in the systems and programming areas is tending to become even more mundane, even to the extent of being automated. New and future graduates are thus presented with fairly limited horizons, but may derive consolation by reflecting that an industry, having accepted the benefits brought by computers, cannot go back to the days of the quill pen and ledger.

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Professor Page opened the ensuing discussion by asking what computing science graduates had been taught which justified differentiating in their favour. Mr. Duncan replied that graduates from Newcastle, for example, received a knowledge of OS/360 which has immediate relevance to their work at Barclays. Mr. Bromberger enquired whether experience of other operating systems was of equal value and was told that this was not the case; what is of use is relevant training which may be immediately applied by the new employee. Professor Ashenhurst suggested that typecasting the new graduate by his particular skill conflicted with a policy of broadening his experience in his work. Did this imply that Barclays would prefer a broader, practical training of graduates? The speaker accepted the point made. Mr. M. Griffiths asked if the particular reference to OS/360 meant that Barclays preferred graduates from universities possessing IBM equipment. After pointing out that Barclays used equipment from several manufacturers, Mr. Duncan stressed that it is the relevance of the graduate's training to the employer's needs which was important. Professor Page commented that the essential principal seemed to be that the employer was prepared to pay the new graduate the money saved in training him because of knowledge that he had acquired in his university career, even if this had been incidental, and followed this by asking whether, because the brighter people were generally able to obtain a university training, the bank was using this fact as a predictor of future performance. Mr. Duncan felt that the first point was the more significant. Professor Wells, supported by Mr. M. Griffiths suggested that if this were the case, then a university education was merely an expensive and inefficient means of fitting a student for his future employment, to which Mr. Duncan replied that providing relevant training was only one aspect of a university's function. Professor Gilles remarked that this situation also applied to other disciplines, for example in engineering, where training apprenticeships were regarded as normal. The question whether graduates had advanced more rapidly than A-level entrants to the company, after a number of years, raised by Professor Randell, was considered by the speaker to be premature in view of the short time for which most staff had been employed. Professor Ashenhurst asked if the bank could not make

more use of information specialists, which the speaker countered by pointing out that British bankers had a conservative approach to such matters. Professor Dijkstra was horrified to think that banks required ready trained technicians from a university. Universities must train for future needs, and not just for the immediate requirements of society. While not disputing the point, Mr. Duncan reiterated his preference for a person with some relevant experience.

Dr. Florentin expressed his admiration of the success achieved by British banks in their use of computers, contrasting the high standards required of their environment with those of the universities. He felt that the speaker had been too modest in this respect. Professor Gilles thought that exposing the student to the rigours of unreliable university systems, although unfortunate, was not without benefit. Professor Parnas suggested that by hiring people with similar training, they would tend, as a group, to resist changes of technology. Mr. Duncan claimed that this was avoided by giving sufficient opportunity for staff to broaden their experience. Professor Parnas wished that the speaker had been able to give some account of the methods by which undetected errors were prevented. Professor Randell thought that a major factor in the banks error prevention, was the existence of a large body of experience with the detection of human errors. Mr. Duncan affirmed in response to Professor Parnas that extensive manual and automatic checking of input data was performed.

A return was made to university teaching considerations by Dr. Hanani, who remarked that universities had to cater for such diverse needs that it was impossible to completely satisfy individual requirements. Dr. Florentin supported this view, adding that only the fundamentals of a subject could be taught. Professor Ashenhurst commented that reliability of large systems was a fundamental which was clearly of relevance to banking, but Mr. Duncan argued that the real problem was one of scale and that this was very difficult to teach.

Professor Melkanoff wondered if the poor standard of report writing by graduates was a consequence of a lack of understanding of the relative importance of the factors involved, but Mr. Duncan refuted this, stating that the fault lay in insufficient practice

in the coherent presentation of material. Professor Wells agreed, that in his experience it was very difficult to get students to appreciate the importance of presenting a clear report of their work. Professor Page felt that universities were hampered by the worsening level of literacy of newly entering students, but Dr. Greenwood suggested that the standard had never been adequate. Mr. Duncan demurred on this point, adding that his concern was that the onus of teaching report writing should certainly not be placed on the graduate's eventual employer. A possible deficiency in the university system was pointed out by Dr. Hartley: although obliged to write reports, students received little or no indication of the quality of presentation. This was amplified by Dr. Newman with the comment that from the later stages of secondary education, those who specialised in scientific subjects received no specific training in essay writing, in contrast to those studying Arts subjects.