8 The use of information technology by the PRS

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Introduction

8.1. IT, the use of computers and telecommunications to record, transmit and store data for issue or future reference, is now an essential element in virtually all businesses beyond the most basic. In organizations which need to handle large amounts of data and perform complex operations on them, the tasks previously requiring armies of clerks are now routinely performed more efficiently and effectively by electronic data processing with a degree of flexibility, scope and speed previously unimaginable. In this context links between data and systems covering discrete but interactive topics or functions are highly effective in minimizing or eliminating duplication and error. Such links are particularly relevant to the PRS's information processing.

8.2. In order to assess the use of IT by the PRS we employed the consultants French Thornton Partnership. An edited version of their report is given in Appendix 8.1 where more details of the matters described in this chapter may be found.

8.3. The collection, processing, storage and distribution of information are core functions of the PRS and its operations have to rely on computer technology. The key administrative functions of the PRS are the capture, validation, processing and, most importantly, the linking together of data on members' details, repertoire, agreements and distribution. Carrying out these normally straightforward but highly interrelated functions involving an ever-growing volume of data can only be achieved in an economically viable way by the use of IT. Licencing of music users and the ensuing collection of royalties, which comprises the main income stream, are obviously important PRS activities.

8.4. It was in recognition of this that the PRS had embarked on a project to integrate its IS. A management plan, `PRS Administrative Improvements 1987-1990', led to the formation of a study team known as LEAP to examine changes in the PRS's administration, computer systems and organization. The team recommended the development of a new integrated computer system to meet the needs of all core administrative departments, the reorganization of departments to eliminate duplication and to simplify procedures.

The PROMS project

8.5. As a result of the LEAP feasibility study, a project known as PROMS (Performing Right On-line Membership Services) was initiated in 1988 and the business case approved by the General Council in May 1990. Right from the start progress reports noted that technical complexity had been identified as a key issue `not fully addressed'. During the second half of 1990 long lists of issues to be resolved appeared in each report, but it was still claimed that the project was well under control. During the first half of 1991 the issues facing the project were becoming more serious, but the General Council was reported as being satisfied that the project was generally proceeding well and that the issues to do with data conversion had been resolved: ie new data file structures had been defined for the new system and the old data files had to be converted to fit in with this. However, by February 1991 it had become clear that a change of programming language would be necessary, and it was acknowledged that there was a high probability of slippage. Nevertheless a report to the Executive Council in July 1991 stated that the project was `on schedule and within budget'.

8.6. Further difficulties, notably with data conversion, which posed a real threat to the implementation date of the project emerged during autumn 1991 but no changes were made to the plans at that time and even in January 1992 the General Council was still expecting the system to be introduced at the end of March. It was not until 4 March that the General Council was told that the planned date could not be achieved and that a fresh plan would be needed. The replanning exercise proved to be difficult, since the problems were more serious than at first thought, especially since it was necessary to set up the new data files correctly, in particular the new Agreements file. The way in which data were held by the PRS meant that it was only by manual intervention, and a great deal of effort, that the existing system was kept going. Largely this is still the case although the PRS now recognizes this problem as requiring top priority attention.

8.7. A revised plan was submitted to the May 1992 General Council meeting which envisaged the initial stage of implementation as taking place in September 1992, with full implementation of PROMS Stage 1 in June 1993. In the autumn of 1992 a full planning and costing revision was carried out indicating that an extension of two years and a further £6 million were required to complete the project. Subsequently, the General Council lost confidence in the project and decided to seek an external assessment (something that had been suggested before by some members of the General Council but rejected). The external assessor recommended that PROMS should be suspended. Eventually, in December 1992 the General Council accepted this recommendation and PROMS was suspended indefinitely. PROMS was finally abandoned in April 1993.

8.8. Our consultants' assessment of PROMS was that `it attempted to change too many things at once with new working practices, new hardware, new system software, new application software and new suppliers'. Even then, there may have been a reasonable chance of success had it not been for the fundamental, underlying fault that much of the core data were of poor quality or missing. Professor Clarke identified the same problems in his report (given in Appendix 7.2). He said: `Before embarking on this task, a radical overhaul of the administrative processes of PRS was necessary to simplify those which would have to be programmed. In the absence of this the progress of PROMS was subjected to repeated delays …' Our consultants also commented that `PRS management now look for a lower risk, more incremental approach. If anything this dominates their thinking, so the PROMS experience may be making them too cautious about the need for new simplified administrative processes and the pace of its implementation'. They summarized the PRS's main IS tasks as simplifying business processes, improving data quality and structures and replacing core administrative systems.

Collaboration between the PRS and the MCPS

8.9. The possibility of collaboration with the MCPS began to be discussed by the General Council in December 1992, and over the next two years both the General Council of the PRS and the Board of the MCPS and their management invested a great deal of time and money in pursuing the concept of collaboration based on an administrative and `core' data processing service company (ServiceCo).

8.10. Originally, the General Council of the PRS had been unanimously in favour of achieving one database of works linked to one database of agreements, products and recordings. This would be maintained by one workforce within a jointly-owned venture for use by both societies. However, the PRS and the MCPS had different intentions as to the scope and functions of ServiceCo. There was no jointly agreed definition of the nature and extent of the proposed collaboration, or on what would and would not be included or excluded. The emerging disagreement about the range of work to be undertaken by ServiceCo polarized into a dispute

on whether it should take over all IT functions as advocated by the MCPS or whether the PRS should retain an IT capability `in order to develop those parts of its business which would not be in the joint administrative company' as its General Council subsequently had approved. The PRS also told us that it wanted to treat ServiceCo as an arm's length supplier on a most favoured basis, which, by definition, was inconsistent with the concept and operation of a joint venture as such. It proved impossible to reconcile the differences between the two organizations and negotiations were suspended indefinitely in late 1994.

8.11. Our consultants concluded that the negotiations had foundered on a difference of views and expectations about the joint venture between the two societies. The groups approached the discussions from very different standpoints and may have mistaken each other's motives. The MCPS was convinced of the merits of collaboration and felt that any obstacles could be overcome once both sides were committed. The PRS on the other hand was less confident, perhaps as a result of the PROMS experience, and wanted more work done to establish the similarities and differences between the PRS's and the MCPS's business processes. The PRS wanted a `project-oriented' approach with a formal definition of the project, including detailed plans and deadlines to be approved by its General Council from which the project team would not deviate. The MCPS preferred an `evolutionary' approach following normal project management disciplines, but within a rolling plan which would give the flexibility to adjust, improve and develop the project to take account of changing business requirements. The MCPS described its approach as an `integrated functional model' and that of the PRS as `fragmented'.

The current IT situation

8.12. Most of the PRS's core computer systems are based on designs and programs which are between 20 and 25 years old and which have been subjected to countless small changes. The systems were never designed to support the efficient linking of data. They were introduced to meet the needs of individual clerical procedures and were built up over time in a piecemeal fashion. The systems do make it possible to distribute royalties, but only at great cost in manual effort. They are not easy to use and information has to be drawn from, and set up on, various different bases. For example, the PRS told our consultants that it takes an average of 20 minutes to register each work.

Software

8.13. The PRS has at least 24 separate application systems grouped into four main on-line `services': Distribution and Documentation; Licensing; Radio and General; and Television. The Society's core application software is written in COBOL (a mature programming language still in use today) which accesses standard computer files. A recent exercise has converted some application programmes from obsolete languages to COBOL, but although the programming language was standardized, the programs are still based on 20-year-old logic and design. However, this exercise allowed the programs involved to be moved off an obsolete operating system and the grouping of all the PRS's systems on to its mainframe computer. In the last few years, applications have been developed for PCs using the Microsoft Visual Basic programming language and Access database software.

8.14. The PRS is unusual in that it does not use a database management system, ie proprietary software designed for the flexible management of interlinking data files. This means that all the software required to maintain the vital links between data files has to be purpose-built. Other than for accounting systems and certain PC-based office applications, the PRS does not use software packages.

Data

8.15. The PRS maintains a large amount of operational data within five main groups. In total, the PRS's data held on the mainframe amounts to 25 to 30 gigabytes. Indicative sizes of the main categories of data used are given below:

- Interested Parties[1] 28,000

- Works[2]	2,400,000
- Agreements[3]	250,000
- Distributions[4]	650,000/1,700,000
- Licences[5]	252,000

[1]Copyright owners and public domain-PRS 28,000, International 1.2 million.

[2]PRS administers a much greater world repertoire.

[3]A record of share of rights between interested parties. An agreement may relate to one work/writer/publisher/area or to many works/writers/sub-publishers/areas.

[4]Earnings mainfile 650,000 records, payment ledger 1.7 million records.

[5]Premises licensed for public performance.

Additionally, information is held on tariffs, invoices and payments, and control statistics are collected on the Society's administrative performance, eg to monitor the time taken to respond to members' queries.

8.16. Much of the data need to be linked together to perform the Society's primary functions of identification, collection and distribution of royalties. However, they are currently held in computer files that are mostly independent of each other and which, as noted above, suffer from a series of quality and structural problems. Solving these data problems requires a good understanding of their nature and of the relationship between the various items.

8.17. Our consultants told us that the current administrative systems and data structures probably generated the two biggest problems for the PRS. First, they added directly to the number, and hence cost, of administrative staff performing basic data capture and linking tasks. Secondly, excessive time and cost were required to make any changes. Accuracy, speed of response and ability to take advantage of new developments were all adversely affected.

8.18. They added that an integrated IT system was vital for the PRS's operations because of the nature of its primary functions. But the current systems were not integrated. For example, the current link between the Repertoire of Works File (RWF) and the Active Works File (AWF) was manual, potentially error prone and certainly costly and time-consuming. They indicated that the PRS strategy report had identified the need for potentially extensive changes to business processes, and that a new integrated system to support core administration functions was required but could find little evidence on how and when these objectives were to be achieved or that the PRS was planning simplified approaches to administration in order to take full advantage of the capability of modern technology. Much of the recent PRS effort on IT had been devoted to securing the systems base after four to five years of stagnation during the PROMS and MCPS exercises in order to establish better foundations for the future.

8.19. The poor state of data had been recognized by the PRS itself as a fundamental problem. The data quality and structures were poor because, *inter alia*, data were not automatically checked on input to files, and data fields were used for purposes for which they were not originally intended. Much of the core data on works and agreements was regarded by the PRS as having potentially serious shortcomings including duplication, misplaced, missing or incorrect data and inconsistencies.

8.20. The indexing and identification of the PRS's data were also found to be poor. The absence of an unique numbering system accepted throughout the industry (or the use of such numbers within the industry where available) for works, jingles, recordings, audio-visuals and other products makes it more difficult for the PRS, and other collecting societies, to match performances to works and agreements, since large proportions of the bulk data received by the Society had to be treated as individual records and manually processed.

8.21. Our consultants commented to us that the overall effect of the IT deficiencies was that the PRS's computer systems were more complicated than need be and that this made it hard to build better systems. The data problems represented a serious limitation on the efficiency and effectiveness of the Society's operations. The situation was exacerbated by an absence of a clear view of the data structures and definitions needed to provide the efficient linking of data, and the lack of adequate database software for the storage of and access to the data. The PRS has since told us that some work on these aspects has recently been prepared, and that the General Council had agreed to an additional sum of £500,000 to be spent on initial data clean-up and linking projects.

IT costs

8.22. The PRS provided us with broad expenditure figures for the last four years and the 1995 capital and revenue budget figures. The expenditure figures given are shown in Table 8.1.

TABLE 8.1 **PRS actual IT expenditure, 1991 to 1994**

£million

	1991	*1992*	*1993*	*1994*
Estimated total IT expenditure	3.27	3.61	3.97	5.11

Source: PRS.

These figures are only indicative since expenditure headings varied between years and there have been adjustments for transfers to software development and exceptional items such as redundancy costs for IT staff.

8.23. The budget for the PRS's IT expenditure in 1995 was planned to be £7.03 million, of which 38 per cent (£2.68 million) was capital and 62 per cent (£4.35 million) was revenue. This budget represented an increase of almost 38 per cent on the actual 1994 expenditure of £5.11 million. The PRS said that this increase was mainly due to provision for IT staffing changes (redundancy payments and contract staff), and for IT infrastructure requirements (mainframe and local area network capacity).

8.24. The 1995 IT capital budget is in line with the PRS's declared theme of `rebuilding the foundations'. Half of this budget is intended for the replacement of existing facilities. The replacements are not intended to provide significant new facilities but rather to improve reliability and robustness as well as forming a better foundation for the future. Compared with other organizations of similar size, the total budget does not look unreasonable, but it is unusual to have such a large proportion of an IT budget allocated to replacement and upgrading of the existing infrastructure. The PRS told us that when this budget was compiled it was on the basis that the proposed collaboration with the MCPS would go ahead.

8.25. The majority (about 60 per cent) of the 1995 IT revenue budget is for staff costs, with the remainder intended for payments to outside organizations for hardware (computer hire), systems software, maintenance, facilities management, contractors and consultants. Compared with other organizations, the Society's proportion of expenditure on new systems (36 per cent) is relatively low.

The future of IT in the PRS

8.26. As reported by Professor Clarke (see Appendix 7.2), the PRS's computer systems have been developed separately, essentially by the computerizing of manual operations in functions such as registration, distribution and licensing which led, he said, to duplication of effort and to the need for manual adjustments. If the PRS were to cope with rapidly increasing amounts of data and the need to process them rapidly, accurately and at minimum cost for its members, it was essential that information handling procedures and the use of IT were improved together. However, our consultants found little evidence to show that the PRS had recognized before last year the importance of the essential links between data and systems in achieving an efficient, effective and error-free operation. Subsequently, the PRS told us that, from late 1994 onwards and coinciding with our investigation, it had set up a joint business/IT team to research, plan and design changes in this area.

8.27. While there have been some individual improvements within the PRS as noted above, until recently there has been little progress made on the central task of improving data quality and structures, and no progress with the updating or development of systems to support them. However, the Society is now beginning to develop its IT strategy and plans.

8.28. The current PRS IT strategy report notes that:

> The lack of integrated information systems supporting the business, and the complexity of the business processes, will make it difficult for the PRS to meet its objectives of maximising distributable revenues and reducing costs by changes to computer systems alone. Significant

reductions in cost and improvements in service are only likely to be achieved through a combination of changes to business process and to the computer system.

The report identifies the need for the development of an integrated system to support core matching and subsequent distribution activities, and for a feasibility study on business process changes as a result of any action arising from `rethinking the business' by the General Council.

8.29. From the minutes of General Council meetings, it appears that only a few Council members are confident in dealing with IT matters. This, coupled with the PRS's governance arrangements discussed in the previous chapter and the PROMS experience, appears to have restricted discussion on the interaction between the Society's administrative procedures and its IS needs, and to have bred a wariness in General Council members towards any major change involving information systems (ie virtually all major changes). This is a significant problem given the limitations of the PRS's current systems and the stark need for an integrated information system, if productivity and cost efficiency are to be improved. The PRS said that it anticipated that this situation would be alleviated somewhat by the appointment of an external director having IT experience and a new Chief Executive, both of whom would sit on the General Council in future.

8.30. To date the PRS's technology strategy has been based on two working assumptions:

(a) the PRS will continue to use ICL hardware; and

(b) a choice is to be made as to which database management system should be adopted (Adabas or Oracle).

The PRS told us that both of these assumptions will be challenged during the current research into the IS strategy.

8.31. One of the outputs from the current IT strategy study is the high level business systems `architecture' shown in Figure 8.1. This diagram confirms that the Society's main activities and supporting data are closely related to one another because:

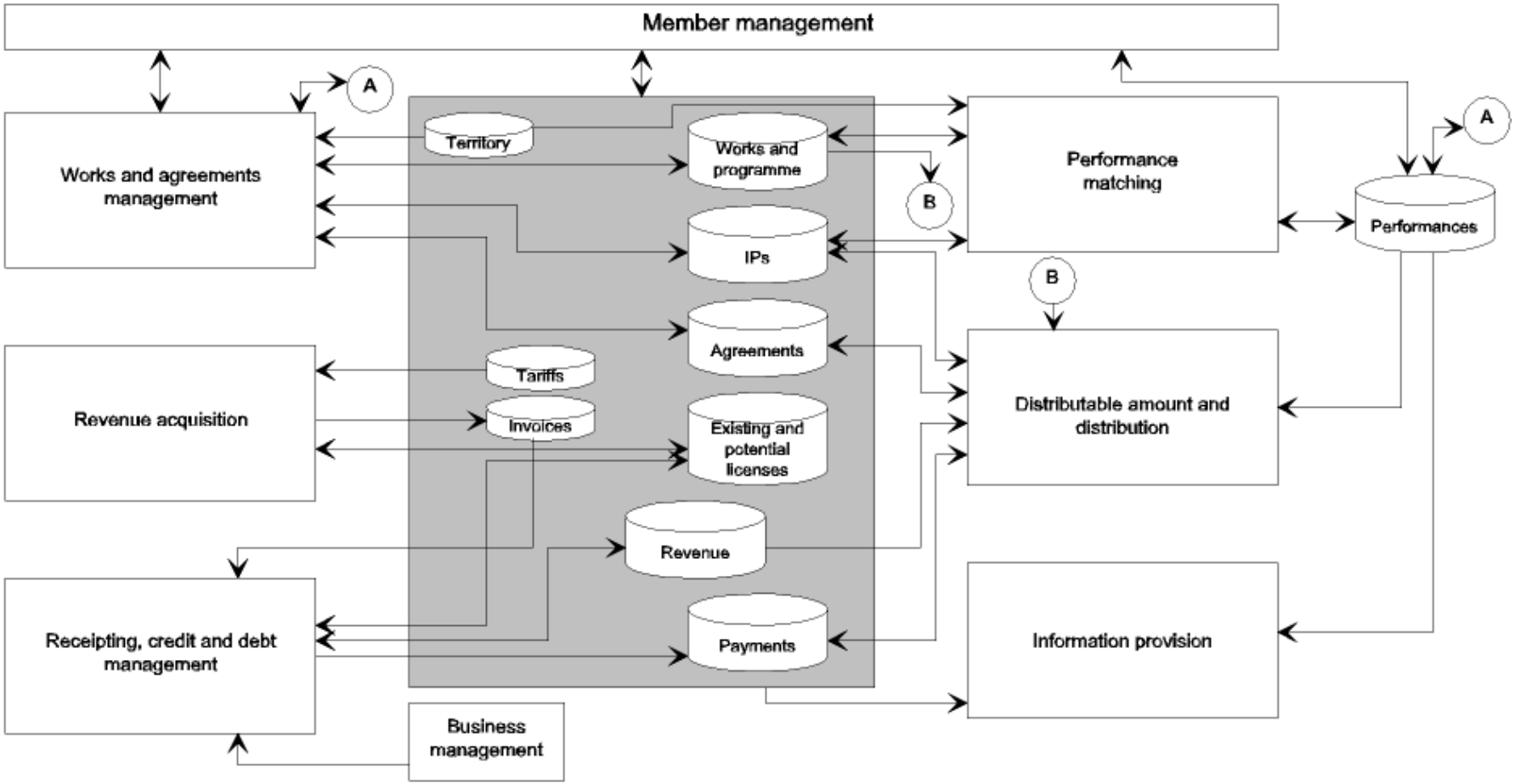
- works and agreements management requires access to six out of ten information groups;
- distribution requires access to five out of ten information groups; and
- performance matching requires access to four out of ten information groups.

This reinforces the need for an integrated information system. Figure 8.1 also shows that revenue acquisition has fewer data links than the other business activities and could therefore be considered for implementation as a separate system.

8.32. With the exception of the facilities management agreement for the provision of ICL mainframe operation and related services, the majority of the PRS's IT needs are provided internally, and our consultants commented that this approach was both practical and cost-effective in the present circumstances. However, if the Society were to embark on a major new project incorporating changes to business processes, supported by new systems, then contract letting and management would need to be given a higher profile because the required skills were not available in sufficient breadth and depth within the PRS.

FIGURE 8.1

High level business systems architecture



Source: PRS.

8.33. Most of the planned IT activity has been approved on the grounds that the improvements in transaction processing and data quality would be needed as a foundation for any future integrated database. The individual projects are intended to link specific files using identifiers, to tidy up data and remove duplication, to convert indexes stored as text for use as automatic links, plus a variety of similar improvements. This would begin to address major problems of the current system which stem from reliance on files which are almost independent of one another and which are currently maintained manually.

8.34. Our consultants told us that the PRS was using the development of prototypes to test concepts and to develop a better understanding of user requirements, but it had relatively few systems development staff and little experience of databases and database development methods, except in the use of PC-based applications. The PRS said that there had been relatively little systems development over the last five years since for the PROMS project it had used software houses and there had been no development work during the discussions of the proposal to collaborate with the MCPS.

8.35. The PRS's software development practices were found to be satisfactory for small developments, but there was no evidence of the formal analysis and design methods that larger-scale projects would require. A large-scale project using a database management system and a more up-to-date language would be a major challenge for the PRS and would require the retraining of its staff and the buying-in of skills from outside. PRS IT management recognized this and were planning to build up internal database skills once the technology choices had been made.

8.36. The PRS advised us that, since our consultants' report in June 1995, work has started on IS strategy and we have seen an initial working draft which has been prepared (Version 1.0 dated 25 October) for review by the Chief Executive and the relevant General Council specialist committees, and in due course by the General Council itself. We do not feel that it is appropriate, at this late stage in the inquiry and on the basis of a first draft only, to comment on this lengthy document save to observe that consideration within the PRS of some of the problems identified by our consultants has evidently commenced. We note, however, that it will not be possible to proceed further with an IS strategy *per se* until the overall company strategy from which it must flow has been been developed and completed by the PRS's Executive Council Strategy Group and ratified by the General Council.

Electronic data capture

8.37. We are aware of a number of international developments in electronic data transmission and capture which could affect significantly the collection and distribution of royalties. The PRS advised us that developments were now at an advanced stage on the institution of an electronic data interchange with the publishers in which registration would include a unique international standard work code number (ISWC). This was in connection with the CISAC initiative which, the PRS said, was now coming to fruition with the introduction of the ISWC, now expected by spring 1996, for all new musical works. Subsequently it would be applied retrospectively to all existing musical copyright works. The ISWC would be used initially for inter-Society and member-Society data handling.

8.38. In its Green Paper, *Copyright and Related Rights in the Information Society* published in July 1995, the European Commission dealt generally with questions of copyright arising from digitization and the consequent disseminations of copyright material through the information superhighway and by digital broadcasting. It noted that it was possible to set up a system of identification for works similar to the ISBN number for books, which could include information on the rightholders and the terms of the licence. A code of this kind known as the ISRC had been established for sound recordings and work was proceeding in other areas.

8.39. It added that such systems of technical identification could facilitate the collection and distribution of fees to rightholders, provided that they were linked to the system used for charging for network access and for administering the corresponding revenue. In Europe regulatory decisions and technical standards might need to be adopted at international level. It was already the case that digital marking systems existed which would make it possible in broadcasting, for example, to determine the time for which a work had been used to within several seconds and in real time. It appeared to the Commission that all such systems needed to be introduced and accepted at international level, if the information society was not to operate to the detriment of rightholders.