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Benchmarking Implementation and Production Costs of Financial Management Information Systems

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Australian National
Audit Office

Canberra ACT
13 March 2002

Dear Madam President
Dear Mr Speaker

The Australian National Audit Office has undertaken a benchmarking study in accordance with the authority contained in the *Auditor-General Act 1997.* I present this report of this study, and the accompanying brochure, to the Parliament. The report is titled *Benchmarking Implementation and Production Costs of Financial Management Information Systems.*

Following its tabling in Parliament, the report will be placed on the Australian National Audit Office's Homepage—http://www.anao.gov.au.

Yours sincerely

P. J. Barrett
Auditor-General

The Honourable the President of the Senate
The Honourable the Speaker of the House of Representatives
Parliament House
Canberra ACT

AUDITING FOR AUSTRALIA

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Abbreviations

ANAO	Australian National Audit Office
DCITA	Department of Communications, Information Technology and the Arts
ERP	Enterprise Resource Planning
FCA	Financial Control and Administration
FMIS	Financial Management Information Systems
FTE	Full-Time Equivalent
HRMIS	Human Resource Management Information Systems
IT	Information Technology
NOIE	National Office for the Information Economy
OGIT	Office of Government Information Technology
OGO	Office for Government On-line
RFP	Request for Proposal
RMS	Records Management System
SSS	Shared Systems Suite
TCO	Total Cost of Ownership
WAN	Wide Area Network

Summary and Opportunities

Summary

Financial Management Information Systems

1. An effective Financial Management Information System (FMIS) is a critical success factor in highly performing public sector agencies. The FMIS is an integrated software application that is used to provide a range of financial processing, recording and reporting services for an agency. Typically, an FMIS would support general ledger, accounts payable and accounts receivable functions. In addition, the FMIS can provide a range of more advanced functionality including inventory, cash and asset management, as well as financial and management reporting services.

2. The FMIS could also be expected to be integrated with other key corporate systems such as human resource management, budget modelling, costing and executive information systems to facilitate a holistic performance information and reporting regime within an agency. As with all such systems, its success depends largely on the extent to which it is useful, and used, at all levels of an agency.

Background to the benchmarking study

3. In November 1995, the then Government endorsed an approach to reduce diversity among FMIS and Human Resource Management Information Systems (HRMIS) in use across the Commonwealth.[1] The strategy to reduce the number of administrative systems (including FMIS products) used by Commonwealth agencies was known as the Shared Systems Suite (SSS) Initiative.[2]

4. The SSS for FMIS products was announced in October 1996. The SSS provided a list of preferred FMIS products that would be able to satisfy the accrual accounting requirements of public sector agencies and the new accrual accountability framework. The FMIS SSS list is shown in the table below.

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[1] ANAO Audit Report No.14, 1996–1997, *Evaluation Process for the Shared Systems Suite*, page ix.

[2] The Government acknowledged that the concept of the SSS Initiative might cause the Commonwealth to miss opportunities for emerging products and concepts if the suppliers on the SSS did not retain their place in their respective industries. However, the Government considered there were a number of information management benefits, which could exceed the potential detriment incurred through missed opportunities. These benefits included potential gains of commonality, reduction in purchase costs through the use of simpler processes, and increased transportability of information across a reduced number of software systems.

Financial Management Information Systems

Company	Product
Wizard Information Services	Finance One
Computer Associates	Masterpiece/2000
Oracle Systems	Oracle Financials
Quality Software Products (QSP)	Universal OLAS
Systems Union	Sun Systems
SAP Australia	SAP R/3

5. As few agencies had accrual functionality when the accrual accountability framework requirement was announced, most Commonwealth budget dependent agencies needed to replace their cash-based accounting systems with a new FMIS from the SSS list of products. The announcement of the introduction of accrual budgeting from 1 July 1999 provided additional impetus for a significant increase in interest in the replacement of existing accounting systems with products from the SSS.

6. It was considered that these systems should be capable of identifying the full, including allocated, cost of delivering program outcomes and/or outputs. It was also recognised that smaller agencies would have difficulty in justifying the acquisition of stand-alone systems. The then Office of Government Information Technology (OGIT)[3] addressed this issue by recommending the use of bureau type facilities that may be supplied by larger agencies.

Status of budget sector implementations

7. In September 1999, the Australian National Audit Office (ANAO) conducted a preliminary survey to provide an overview of progress towards the implementation of accrual financial systems in accordance with the Government's financial reform agenda. Fifty-seven of the 64 agencies surveyed provided a response by March 2000. Survey responses indicated that since January 1993, 44 agencies (77 per cent) had implemented new systems and a further three agencies (five per cent) were implementing a new FMIS. Of the remaining 10 agencies that responded to the survey:

- eight already had an accrual system;
- one obtained accrual FMIS services from another agency; and
- one was selecting a new FMIS from the SSS.

[3] OGIT was the agency responsible for administering the SSS Initiative. See also footnote 17 on p. 29.

8. Of the 44 surveyed agencies that had implemented a new FMIS, four agencies (nine per cent) were unable to estimate implementation costs. Of the remaining 40 agencies, responses indicated they did not track the full cost of their implementations. In particular, a number of agencies only recognised the licence and/or contract costs, while few agencies considered the costs of internal staff, infrastructure, specialist contractors and training. However, these implementations represented a significant investment of budget sector resources. Overall, based on the reported costs of 40 agencies, the total cost of implementations was at least $100 million.

Benchmark study objectives

9. In view of the significant level of investment by Commonwealth agencies in the implementation and production of FMISs, the ANAO, in conjunction with Gartner,[4] undertook a benchmarking study within the Commonwealth budget sector with the objective of determining and reporting on FMIS:

- implementation and production costs; and
- implementation timeframes.

10. The benchmarking study also provides some data on resource support, size, volume and utilisation of the FMIS information. These data and metrics have significant implications for FMIS product selection as can be seen from the discussion in Chapters 2 through 4.

11. Agency responses to the study were collected between February and October 2000, analysed, and the results reported to agencies during March and April 2001. The detailed report provided to each agency compared their results with those in the Commonwealth peer group and with the Gartner external peer group. Other Commonwealth agencies can compare their performance against peer group benchmark metrics results and use the information to identify and diagnose areas of concern in the implementation or management of their FMIS.

12. Between April and September 2001 the ANAO finalised the related Financial Control and Administration (FCA) Audit Report[5] which details the results of FMIS selections and implementations across the same eight Commonwealth budget sector agencies (the Commonwealth peer group) considered in this benchmarking study.

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[4] Gartner has considerable experience in Information Technology (IT) benchmarking and has best practice metrics from its private and public sector, national and international client base.

[5] ANAO Audit Report No.12 of 2001–2002, *Selection, Implementation and Management of Financial Management Information Systems in Commonwealth Agencies*.

Interpretation of benchmark study results

13. The ANAO benchmarked FMIS selection, implementation and production costs, time and quality measures in eight agencies that had completed or substantially completed implementations of the proprietary systems SAP R/3, QSP Financials and Finance One. For the purpose of analysing and presenting the results of this study the responses of benchmark participants have been categorised by:

- source—Commonwealth or Gartner organisations;
- size—agencies classified as small, medium or large-sized; and
- product type—products were labelled Product 1, 2 and 3 and then categorised as mid-range accounting, or large accounting or Enterprise Resource Planning (ERP) products.

14. This categorisation provides agencies with more targeted insights and opportunities for FMIS selection, implementation and production. While the emphasis of the ANAO benchmarking studies is to make available public sector benchmarks for use as an organisational improvement tool, they also provide an opportunity for an across-the-board assessment of system implementations by the Commonwealth public sector. This assessment is based on a comparison of responses from participating Commonwealth agencies (the Commonwealth peer group) and data from national and international organisations (the Gartner external peer group[6]).

15. The external peer groups used as a basis for comparison throughout this report are drawn from the Gartner benchmarking databases. To facilitate a more meaningful comparison, Gartner sought to match organisation size and complexity factors to the benchmarked Commonwealth peer group agencies. This meant that there was a different external peer group for each agency in the Commonwealth peer group.

16. Although the report makes a number of comparisons between the Commonwealth and external peer groups, it is important to note that results against each of the benchmarks should not be assessed in isolation as this rarely provides adequate insight into how different outcomes have been achieved. Determining the specific practices responsible for high performance, and adapting and applying them within an organisation as a basis for process improvement was not included within the scope of this study, but were covered in the related FCA Audit Report.

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[6] The external peer group data is derived from Gartner's databases.

17. Commonwealth agencies can use the information presented in this report to:

- compare their own implementation and FMIS management performance against the Commonwealth and Gartner external peer groups;
- diagnose areas relating to the implementation or management of their own FMIS in terms of cost, timeframe, and suitability of product which may warrant further investigation; and
- highlight opportunities for business re-engineering, process improvement or alternate delivery options.

18. Agencies should note that the results of this study are limited to the extent that data in the study has been derived from self-assessments. The results also do not take account of, or distinguish between, the different environments in which the FMIS were implemented and operate, such as the public and private sectors. As a result, the benchmark study provides a broad indication of differences in performance between the two peer groups. It is also worth noting that a number of agencies experienced difficulty accessing the required information as a result of difficulties in locating relevant documentation and records.

19. The related FCA Audit Report, referred to in paragraph 12, provides insights into some of the factors that agencies may wish to consider when evaluating their results and in managing their systems in the future, and provides some insight into the extent to which agencies' core attributes, functionality and cost-effectiveness requirements were satisfied. The ANAO therefore suggests that this benchmarking report be read in conjunction with the related FCA Audit Report. Where appropriate, the findings of the related FCA Audit are discussed in conjunction with the benchmarking analysis in this report to provide further insight into the benchmark results.

Summary of conclusions

Overall conclusion

20. The results of the benchmarking study, and related FCA Audit, suggest that some agencies could have achieved better implementation outcomes if they had applied more appropriate procurement, implementation and FMIS management practices. In addition, some agencies experienced relatively high whole-of-life costs for their FMIS, and specifically high ongoing annual FMIS production costs, as a result of implementing and maintaining products that were not optimal in relation to their size and processing requirements.

Selection

21. The selection of an appropriate FMIS product was vital to Commonwealth agencies achieving the required outputs and outcomes from their FMIS implementation. The size of the agency, the nature and complexity of agency work, and cost should be the key criteria used in the selection process to assess the best value-for-money solution. However, the results of the benchmarking study suggest that most agencies selected FMIS products that were inconsistent with their size and transaction processing[7] requirements as a result of not sufficiently addressing the above key selection criteria. As a consequence, agencies generally did not utilise the full processing capabilities of their selected systems.

22. During product selection most agencies considered software licence costs to be indicative of whole-of-life costs. As a result, most agencies selected large accounting or ERP products that had lower software licence costs, but had higher whole-of-life costs. This situation emphasises the importance of understanding the relationship between software licence costs and whole-of-life costs for product types, as well as completing a whole-of-life costing as part of the selection process.

Implementation and production

23. Having selected an FMIS, appropriate arrangements then need to be put in place to achieve a timely and cost-efficient implementation, and a cost-efficient production environment.

24. ANAO survey results indicated that between June 1997 and November 1998 at least 26 agencies were implementing a new FMIS. This placed considerable pressure on the available implementation resources during this period. In particular, the number of concurrent implementations limited the availability of contractors with the requisite product/implementation skills and/or minimised the opportunity for agencies to learn from previous implementations.

25. The benchmark results indicated that the cost of FMIS implementation and production for the Commonwealth peer group were, on average, marginally higher than that of the Gartner external peer group. These higher costs were as a result of a higher level of reliance on external resources, higher cost of Full-Time Equivalents (FTEs),[8] and/or larger implementation teams. These factors

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[7] The metric used in this study to establish the transaction processing requirements within an agency was the number of dialog steps recorded by the FMIS in a month.

[8] A measurement that calculates the total logical number of FMIS implementation or production staff. It is calculated by counting the number of days (including all leave and administration time) taken by implementation or production staff to complete an implementation or production activity.

were observed particularly in relation to agencies that implemented large accounting or ERP products. Most of these factors were also observed, during the following stages:

- FMIS implementation in small-sized agencies; and
- FMIS production in medium-sized agencies.

26. These results reflect different practices between small and medium-sized agencies in recording their costs between FMIS implementation and production, for the purposes of this study. For example, small-sized agencies had higher costs during implementation, but lower costs during production, relative to medium-sized agencies. The related FCA Audit found that the cost allocations between implementation and production represented different implementation approaches. Smaller agencies sought to implement the majority of the specified functionality by the 'go-live' date while, in comparison, medium-sized agencies sought to implement a base level of functionality by the 'go-live' date and subsequently implemented additional functionality. Some of the higher costs of FMIS production, observed in this study, were also associated with agencies undertaking significant remedial work to address problems with the implemented functionality.

27. Agencies from the Commonwealth peer group that recorded higher FMIS implementation and production costs generally spent less on internal resources. The low cost of internal resources compared to external resources suggests that agencies in the Commonwealth peer group had insufficiently skilled and experienced internal resources available. They therefore needed to engage relatively more expensive external resources to implement and maintain their selected FMIS.

28. The benchmarking study found that product type had a significant influence on implementation timeframes and FMIS costs. In comparison, agency size had a relatively minor influence. Not unexpectedly, agencies that implemented a large accounting or ERP product generally had a longer implementation elapsed time than those that implemented a mid-range accounting product (primarily due to product or agency complexity). In addition, longer implementation times generally increased implementation costs, and large accounting or ERP products had higher costs for both FMIS implementation and production.

Opportunities for Improved Performance

This section of the report presents the key opportunities, by agency size and product type, that Commonwealth agencies may consider useful when selecting, implementing and maintaining an FMIS. In some cases, the opportunities have general applicability to all agencies and product types. Where appropriate, indicative ranges have been provided by agency size or product type to assist agencies in setting their own targets and monitoring their progress. The ranges presented in this section are based on the results achieved by agencies in this study that had a better overall outcome for a particular activity and, therefore, there is not necessarily a correlation between the results presented below and the detailed results presented in Chapters 2 through 4. The assessment of the agencies overall outcome was based on a combination of their results from this study, the related FCA Audit and the preliminary ANAO survey. Agencies should note, however, that indicative ranges provided below may differ over time given changes in the environment, and the value of money and services.

If in using this information an agency's results fall outside the ranges presented in this section, there is an opportunity for the reasons for this to be investigated to determine whether the variations are acceptable given the particular circumstances of the agency. If the agency considers the variations cannot be reasonably explained, an appropriate action plan which addresses the cause(s) of the problem should be developed.

Opportunities for agencies

29. The ANAO considers that some agencies have an opportunity to improve their FMIS selection, implementation and management procedures. In particular, the ANAO considers that there are opportunities for agencies to address the following issues.

A. Establishing and applying key selection criteria in the product evaluation process that will assist in selecting a product appropriate to an agency's size and business requirements.

Improved management of the selection process for an FMIS can be assisted by the establishment of appropriate key selection criteria which include agency size and transaction processing[9] requirements.

The results of the benchmarking study suggested that agency size and product type had limited influence on agencies establishing and applying key selection criteria.

[9] Transaction processing requirements within an agency can be measured using the number of dialog steps recorded by the FMIS in a month. Dialog steps is a measure of the number of screen changes to process a transaction.

B. Establishing a better understanding of the relationship between software licence costs and other product costs, both in implementation and production, to estimate whole-of-life costs as part of the initial product evaluation process.

Management of the selection process for an FMIS can also be improved by a better understanding of the whole-of-life costs of implementing and maintaining a large accounting or ERP product as part of the evaluation process. This understanding of the whole-of-life costs will provide the basis for developing a comprehensive implementation and production budget. The ANAO Better Practice Guide on *Life-Cycle Costing*, published in December 2001, could assist agencies in developing an understanding of the whole-of-life costs.

The results of the benchmarking study suggested that product type had a significant influence on the relationship between software licence costs and other product costs.

C. Developing systems and practices to identify and then capture the whole-of-life costs of implementing and maintaining FMIS products.

Improved management of an agency's FMIS can be achieved through: the development of comprehensive budgets; the implementation of systems and practices to capture the costs of implementing and maintaining an FMIS; and the periodic monitoring of budgets and timetables. Table 1 below shows by agency size the indicative ranges achieved by better performing agencies for expenditure per future (implementation) and peak (production) concurrent user.[10]

Table 1
Indicative ranges for cost per concurrent user

	Small agencies $000	Medium agencies $000	Large agencies $000
Future concurrent users	24–33.5	23–39	35–44
Peak concurrent users (stable system)	14.5–19	14.5–20	na
Peak concurrent users (with ongoing implementation or upgrade activities)	24–33.5	23–39	na

na Not available

[10] Future concurrent users are the planned number of concurrent users of the FMIS when it is fully operational. Peak concurrent users are the highest number of concurrent users reported during a month of FMIS production.

The results of the benchmarking study also suggested that small or medium-sized agencies that implement a mid-range accounting product could aim to achieve a cost per concurrent user at the lower end of the relevant indicative range. In contrast, agencies that implement a large accounting or ERP product could aim to achieve a result at the higher end of the relevant indicative range.

D. Setting realistic project timeframes for implementing, modifying and upgrading FMIS products, and periodically monitoring progress against and, where necessary, revising these timeframes.

Improved management of an agency's FMIS can also be achieved through: the development of realistic timeframes for implementing, modifying and upgrading the FMIS; and the periodic monitoring and, where necessary, revision of these timetables in conjunction with project budgets. Better performing agencies established implementation timeframes of between 8 and 12 months.

The results of the benchmarking study suggested that agency size had some influence on the implementation timeframe. Smaller sized agencies could generally aim to establish and achieve an implementation timeframe at the lower end of the indicative range.

E. Obtaining regular involvement of senior management prior to, during and after FMIS implementation.

Another opportunity to improve the management of an agency's FMIS is through the development of a regular briefing and review process for senior management, to assist them in making decisions in the selection, implementation and management of information systems. Better performing agencies achieved expenditure on the senior management briefing and review process of between:

- 2 and 5 per cent of total FMIS implementation expenditure; and
- 2 and 6 per cent of total FMIS production expenditure.

The results of the benchmarking study suggested that agency size and product type had limited influence on these indicative ranges.

F. Establishing an FMIS implementation and production team of an appropriate size to support the future or peak concurrent users of the system.

The study identified that the establishment of an appropriately sized team to support the required number of future (implementation) and peak (production) concurrent users can also assist the management of an agency's FMIS. Table 2 below shows by agency size the indicative ranges achieved by better performing agencies for the number of future or peak concurrent users per FMIS FTE.

Table 2
Indicative ranges for the number of concurrent users per FMIS FTE

	Small agencies	Medium agencies	Large agencies
Number of future concurrent users per FMIS FTE	3–5	4–6	5–7
Number of peak concurrent users (stable system) per FMIS FTE	7–10	8–10	na
Number of peak concurrent users (with ongoing implementation or upgrade activities) per FMIS FTE	3–5	4–6	na

The results of the benchmarking study suggested that product type had a limited influence on these indicative ranges.

G. Establishing an FMIS implementation and production team, respectively, with an appropriate mix of internal and external resources.

The establishment of an appropriate mix of internal and external resources is a key element in the effective management of an agency's FMIS. Table 3 below shows by product type the indicative ranges achieved by better performing agencies for expenditure on internal resources as a percentage of total FMIS implementation or production expenditure.

Table 3
Indicative ranges for expenditure on internal resources as a percentage of total implementation or production expenditure

	Internal Resources as a Percentage of Total Implementation Expenditure	Internal Resources as a Percentage of Total Production Expenditure
Mid-range accounting products	48–52	65–76
Large accounting or ERP products	45–55	45–55

The results of the benchmarking study suggested that agency size had some influence on these indicative ranges. The study results also suggested that limited relevant staff knowledge and experience may result in a lower percentage of internal resources being used in the FMIS implementation or production team.

H. Establishing an appropriately skilled FMIS implementation and production team to support the implementation and production processes.

Finally, the study identified that the establishment of an appropriately skilled team to support both the implementation or production processes is another aspect which can improve an agency's management of its FMIS. Table 4 below shows, by agency size, the indicative ranges achieved by better performing agencies for the average cost per FMIS FTE.

Table 4
Indicative ranges for the average cost per FMIS FTE

	Small agencies $000	Medium agencies $000	Large agencies $000
Cost per FMIS implementation FTE	70–90	80–105	105–130
Cost per FMIS production FTE	90–110	80–110	na

The results of the benchmarking study suggested that product type had a significant influence on the indicative ranges presented for the average cost per FMIS FTE. Agencies that implement a mid-range accounting product could aim to achieve a cost per FTE at the lower end of the relevant indicative range. In contrast, agencies that implement a large accounting or ERP product could aim to achieve a result at the higher end of the relevant indicative range.

30. Agencies will need to determine how these opportunities can best be adapted to the specific circumstances of their FMIS management arrangements.

Agencies' response

31. Agencies agreed with the conclusions and opportunities presented in this report. Some agencies indicated that they were intending to use this report to assist with the planning, implementation and post-production stages of their FMIS upgrade project to help improve their performance.

Benchmarking Analysis and Conclusions

1. Introduction

This chapter outlines the administrative systems and some related financial management reforms that provided an imperative for agencies to implement accrual financial systems. It sets out the benchmark study objectives, scope, methodology, evaluation criteria and guidance for the interpretation of the benchmark results.

Financial Management Information Systems (FMIS)

1.1 An effective Financial Management Information System (FMIS) is a critical success factor in highly performing public sector agencies. The FMIS is an integrated software application that is used to provide a range of financial processing, recording and reporting services for an agency. Typically, an FMIS would support general ledger, accounts payable and accounts receivable functions. In addition, the FMIS can provide a range of more advanced functionality including inventory, cash and asset management, as well as financial and management reporting services.

1.2 The FMIS could also be expected to be integrated with other key corporate systems such as human resource management, budget modelling, costing and executive information systems to facilitate a holistic performance information and reporting regime within an agency. As with all such systems, its success depends largely on the extent to which it is useful, and used, at all levels of an agency.

Background to the benchmarking study

1.3 In November 1995, the then Government endorsed an approach to reduce diversity among FMIS and Human Resource Management Information Systems (HRMIS) in use across the Commonwealth. The strategy to reduce the number of administrative systems (including FMIS products) used by Commonwealth agencies was known as the Shared Systems Suite (SSS) Initiative.[11] It was envisaged that there would be benefits in relation to costs, integration, efficiency and effectiveness from implementing a common set of systems.

[11] It was acknowledged that the concept of the SSS Initiative might cause the Commonwealth to miss opportunities for emerging products and concepts if the suppliers on the SSS did not retain their place in their respective industries. However, it was considered there were a number of information management benefits, which could exceed the potential detriment incurred through missed opportunities. These benefits included potential gains of commonality, reduction in purchase costs through the use of simpler processes, and increased transportability of information across a reduced number of software systems.

1.4 The SSS for FMIS products was announced in October 1996. The SSS provided a list of preferred FMIS products that would be able to satisfy the accrual accounting requirements of public sector agencies and the new accrual accountability framework. The FMIS SSS list is shown in the table below.

Financial Management Information Systems

Company	Product
Wizard Information Services	Finance One
Computer Associates	Masterpiece/2000
Oracle Systems	Oracle Financials
Quality Software Products (QSP)	Universal OLAS
Systems Union	Sun Systems
SAP Australia	SAP R/3

1.5 As few agencies had full accrual functionality when the accrual accountability framework requirement was announced, most Commonwealth budget dependent agencies needed to replace their cash-based accounting systems with a new FMIS from the SSS list of products. The announcement of the introduction of accrual budgeting from 1 July 1999 provided additional impetus for a significant increase in interest in the replacement of existing accounting systems from the SSS. It was considered that these systems should be capable of identifying the full, including allocated, cost of delivering program outcomes and/or outputs.

1.6 It was intended (or at least interpreted by agencies as a requirement) that all budget-sector agencies would select one of the FMIS products listed on the SSS as their replacement system if it was not possible to cost-efficiently[12] enhance their existing system.

Study objective

1.7 The ANAO, in conjunction with Gartner, undertook a benchmarking study within the Commonwealth budget sector with the objective of determining and reporting on FMIS:

- implementation and production costs; and
- implementation timeframes.

[12] A cost-efficient upgrade of an existing system was defined as occurring if the total cost of upgrade was less than 5 per cent of selecting and implementing a replacement FMIS.

1.8 Agency responses to the study were collected between February and October 2000. Responses were analysed between February 2000 and March 2001, and the results of analysis were reported to agencies during March and April 2001.

1.9 The benchmark study also provides some FMIS resource support, size, volume and utilisation information. These data and metrics have some implications for how agencies could improve FMIS product selection.

1.10 The study also collected similar information for provision of distributed computing and Wide Area Network (WAN) services within agencies. A brief analysis of this information is provided in Appendix 2 to this Report.

1.11 The benchmarking study was undertaken with the assistance of Gartner. Gartner has considerable experience in Information Technology (IT) benchmarking and has best practice metrics from its private and public sector, national and international client base. In conjunction with the Australian National Audit Office (ANAO), Gartner:

- developed the benchmark methodology and questionnaire;
- processed agency responses by applying the responses to its Consensus Model to produce key metric results for agencies; and
- determined peer group key metric results which offered a basis for comparison for each agency in the study.

1.12 While the emphasis of ANAO benchmarking studies is to make available public sector benchmarks for use as an organisational improvement tool, they also provide an opportunity for an across-the-board assessment of the Commonwealth public sector for a particular activity. This study reports agency benchmark results and compares them to both internal and external peer groups. The internal peer group comprises the eight Commonwealth budget sector agencies that were benchmarked for this study (the Commonwealth peer group). Each agency's external peer group (the Gartner external peer group) was selected from Gartner's databases of public and private sector organisations. Peer organisations were selected by Gartner if they were of a similar size and complexity to the relevant Commonwealth agency. Complexity factors used to select peers related to both the IT and the FMIS environments.

1.13 The benchmark study was conducted in conformance with ANAO benchmarking standards.

Scope of the study

1.14 The study benchmarked aspects of FMIS selection, implementation and production in eight agencies that had completed or substantially completed implementations of SAP R/3, QSP Financials and Finance One. These implementations were undertaken subsequent to the announcement of the SSS in October 1996. The 'go-live' dates for the agencies included in the study were between 1 July 1997 and 1 December 2000. As a result, the data collected for the study related to costs, time and other performance measures of agencies between 1997 and 2000.

1.15 The findings and conclusions in this report are based on information provided by the eight agencies in response to a questionnaire developed by Gartner. The questionnaire sought cost, time and other performance information that some agencies found difficult to provide. Agency responses were provided by both the finance and information technology areas, thereby providing data for aspects of both areas of corporate services.

1.16 The agencies benchmarked ranged in size from small to large. Using the then Office of Government Information Technology's (OGIT's) guidelines, the ANAO classified agencies as small-sized,[13] medium-sized[14] or large-sized[15] based on staff numbers. These guidelines were provided to agencies to assist in the selection of FMIS products identified on the SSS[16] and indicated that user numbers were the determinant of agency size. The user number measures used in the benchmark study were FMIS concurrent user numbers and the number of distributed computing users. There were four small-sized agencies, three medium-sized agencies and one large-sized agency included in the study. A further discussion of agency size and the implications for selection and utilisation of FMIS products is provided in Chapter 2.

1.17 The agencies participating in the study have each been provided with a detailed report comparing their results with those in the Commonwealth peer group and with the Gartner external peer group. Other Commonwealth agencies can compare their performance against peer group benchmark metrics results and use the information to identify and diagnose areas of concern in the implementation or management of their FMIS.

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[13] Small-sized agencies had between 1 and 999 distributed computing users. However, the ANAO did not examine agencies with less than 400 staff.
[14] Medium-sized agencies had between 1 000 and 9 999 distributed computing users.
[15] Large-sized agencies had more than 10 000 distributed computing users.
[16] *FMIS and HRMS Shared Systems Suite at a Glance*, January 1997, p. 4.

Other ANAO products that contributed to the analysis in this report

Preliminary ANAO survey

1.18 As a precursor to the benchmark study of the eight agencies, the ANAO undertook a survey of 64 agencies (including the eight agencies audited) to provide an overview of progress towards the implementation of accrual financial systems in accordance with the Government's financial reform agenda. The survey collected information on FMIS implementation timeframes, implementation cost, systems selected, and satisfaction with the implementation. Thirty-eight small-sized agencies (67 per cent), 16 medium-sized agencies (28 per cent) and three large-sized agencies (5 per cent) responded to the survey.

Financial Control and Administration (FCA) audit

1.19 At the same time as the benchmark study, the ANAO undertook an audit of the FMIS selection, implementation and post implementation management practices of the eight agencies included in the benchmark study. The results of this audit are reported in ANAO Audit Report No.12 of 2001–2002. As part of this audit, the ANAO also reviewed the influence of the SSS Initiative, and particularly the then Office for Government On-Line's (OGO's), (formerly OGIT's)[17] administration of that initiative, in the selection and implementation management of FMIS products in Commonwealth budget sector agencies.

1.20 The audit provided the ANAO with an understanding of each agency's environment as well as the selection, implementation and post implementation management practices adopted by the agencies and the success of these practices. Through this understanding the ANAO was able to provide more detailed analyses for each agency involved in the benchmark study by establishing links between audit and benchmark findings.

1.21 Where appropriate the findings from the related FCA Audit and the ANAO survey have been incorporated into the benchmark analysis to provide agencies with a better understanding of the benchmark results and FMIS selection, implementation and production outcomes.

[17] In October 1997, the National Office of Information Economy (NOIE) was attached to the Department of Communication and the Arts (DoCA). OGIT was renamed OGO in October 1998 and became a division within the Department of Communications, Information Technology and the Arts (DCITA). Since the commencement of the study, OGO has become part of NOIE.

Factors affecting the study

1.22 The implementation timeframe in each agency varied, ranging from three to 15 months. As a result of this variation, agency results have been annualised to facilitate a comparison between agencies. However, adjustments have not been made to reflect the time value of money.

1.23 Results of the related FCA Audit showed that most agencies did not have sufficiently robust records management and monitoring programs in place to provide complete costs of FMIS implementation and production activities.

1.24 Comparison against benchmarks alone rarely provides sufficient insight into how outcomes have been achieved. Discovering the specific practices responsible for agencies' results is not the purpose of this study. The related FCA Audit was conducted in conjunction with this study and reported on agencies' FMIS selection and implementation outcomes. The aim of this benchmarking report is to provide a snap shot for Commonwealth budget sector agencies to compare their performance against their internal and external peer groups.

1.25 The accuracy of the metrics was dependent on agencies providing complete and accurate information. The quality assurance process able to be performed on the benchmark data was not sufficient to guarantee data integrity, and most agencies experienced difficulty in providing complete and accurate cost information for the benchmarking study. Several agencies indicated that they had experienced difficulties in determining the full cost of their FMIS implementation.

1.26 Benchmark information does not take account of different environments in which FMIS implementations and management occur such as between the public and private sectors. As a result, the benchmarking study provides a high-level insight into the differences in an agency's performance against the Commonwealth and external peer groups, rather than a definitive explanation of the differences.

Benchmark methodology

1.27 For the purposes of this study the ANAO relied on the benchmark methodology used internationally by Gartner to benchmark IT activities. Gartner has a database for each different functional area[18] contained within an IT environment. The definition of each functional area is contained within a Consensus Model developed by Gartner.[19] The Consensus Model provides a

[18] For example, distributed computing, WAN and FMIS implementation.
[19] Gartner presented this model to agencies in the data-gathering phase of the study.

framework for data collection, processing and analysis for an IT functional area. It also provides the basis for peer group selection.

1.28 The benchmarking study commences with the identification of IT functional areas to be considered in a study. For the purposes of this study five functional areas were examined:

- FMIS implementation;
- FMIS production;
- application server (a metric for this functional area is discussed during the FMIS production discussion);
- distributed computing; and
- Wide Area Networks (WAN).

1.29 A questionnaire was designed to collect information necessary to calculate the key metrics for each IT functional area to be considered in this study. Agency responses to the questionnaires were reviewed, and unusual responses clarified. Once the base data was validated it was normalised so that agency information could be presented and determined on the same basis as other Commonwealth and external peers. Gartner then calculated agency and peer metrics using the relevant Consensus Model. The process involved in external peer selection is outlined at paragraph 1.32 below.

1.30 Following the calculation of peer metrics, the ANAO analysed agency metric results using information collected through the related FCA Audit and prepared individual benchmark reports for each agency.

Gartner external peer group selection

1.31 Based on the parameters for each Consensus Model, a different peer group may be selected for each IT functional area of an agency. That is, an agency's Gartner external peer group for the FMIS implementation functional area could be different from its Gartner external peer group for the distributed computing functional area.

1.32 Peer selection commenced with Gartner obtaining agency data and identifying several key elements that are validated against its databases of client information. Once Gartner, and the agency, were satisfied that the data was correct, Gartner proceeded to select the peer group of 'best fit' from its databases.[20]

[20] Each database contains information that is no more than two years old, thereby preserving the relevance of the information in the databases.

1.33 Gartner selected a limited group of peers from the database for each functional area. The actual number of peers selected varied as Gartner attempts to match organisation size and complexity factors to those recorded by the agency. Typically there were six or seven peers, although there may have been 10 or more for some agencies' functional areas.

Assumptions

1.34 There were two key assumptions used in preparing agency results. These were:

- the calculation of implementation and production costs both included depreciation for hardware and software. Depreciation was calculated on a straight-line basis using the estimated useful life of an agency's hardware and software; and
- peer group user numbers are adjusted by Gartner so that they are equivalent to agency user numbers. By multiplying the adjusted user numbers by the cost per user, Gartner derived total costs for an agency's peer group, thereby allowing a more meaningful total cost comparison.

Evaluation criteria

1.35 Gartner identified a series of benchmark metrics that were used as criteria for assessing the dimensions of cost, timeframe and quality.

1.36 The two key benchmark metrics that were used for assessing the cost of implementations and the supporting computing environment were:

- cost per future concurrent user (FMIS implementation), which are the planned number of concurrent users of the FMIS when it is fully operational; and
- cost per peak concurrent user (FMIS production).

1.37 Other benchmark metrics used in the analysis of cost for implementations and FMIS production were:

- software cost as a percentage of total implementation cost;
- application server costs per peak concurrent user;
- cost of implementation/production resources (internal, external and other) per future/peak concurrent user;
- cost of senior management involvement per future/peak concurrent user; and
- number and cost of implementation/production FTEs.

1.38 While total cost information was available, it was not used to assess agency results. The cost per user/device comparisons (discussed in the following chapters) provide more meaningful information than comparisons of absolute or total cost.

> *Further, the number of concurrent users is important because it is a chief driver of… implementation cost—it is a better indicator than named users because enterprises vary so greatly in usage patterns. A large number of named users may include many occasional users whose needs do not have much affect during implementation and who do not require much ongoing support.*[21]

As a consequence Gartner and the ANAO consider concurrent users, which provides the basis for most of the graphed comparisons, gives a more reliable correlation with cost.

1.39 The key benchmark metric that was used as the criterion for assessing the timeframe of implementations was: FMIS implementation days per future concurrent user.

1.40 In addition to cost and time metrics, the four key benchmark metrics that were used as criteria for assessing the suitability of product selections, implementations and/or FMIS production were:

- number of concurrent users per agency;
- number of distributed computing users per agency;
- number of dialog steps per month;[22] and
- ratio of users to full-time equivalents (FTEs).

1.41 The benchmark metrics used for assessing cost also proved useful when determining the quality of FMIS selection, implementation and production decisions.

1.42 Other benchmark metrics that affected the cost of implementations and FMIS production were:

- cost per distributed computing user (distributed computing); and
- cost per device (WAN).

These are discussed further in Appendix 2 to this report.

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[21] Refer to *SAP R/3 and Its Implementation Challenges*, Inside Gartner This Week, Vol XV No. 20, p. 8.
[22] Dialog steps is a measure of the number of screen changes to process a transaction.

Interpretation of the data

1.43 The following chapters deal with the benchmark metrics relevant to each of the three major steps in a management information system procurement and implementation project, namely: selection (Chapter 2); implementation (Chapter 3); and production (Chapter 4). The benchmark metrics presented are generally the weighted average (on a per concurrent user basis) of the relevant peer group (Commonwealth or Gartner).

1.44 In some cases benchmark metrics used in charts and tables have also been presented in quartile charts. A quartile chart is divided into four sections, with each section representing 25 per cent of the sample data. These charts provide information on the spread of results around the median or middle result, and allow agencies using this report to determine their position relative to the surveyed group.

1.45 The quartiles have been determined from the source data provided by the Commonwealth peer group agencies. The quartiles for the Gartner external peer group have been determined based on data within Gartner's databases.

1.46 All monetary amounts used in this report are in Australian dollars unless stated otherwise. Monetary amounts represent the unadjusted costs to agencies of FMIS implementation and production, between January 1997 and June 2000.

1.47 The benchmark and cost information in this report provide a relevant and useful basis for comparison to other Commonwealth budget sector agencies included in the study, and to peers selected from Gartner's databases. However, Gartner metrics only provide a comparison of inputs not of outcomes. This means that reported costs are not necessarily indicative of the success of an implementation.

Previous audit coverage

1.48 Prior to Audit Report No.12 of 2001–2002, *Selection, Implementation and Management of Financial Management Information Systems in Commonwealth Agencies,* the ANAO had not undertaken significant research into the selection, implementation and maintenance of accrual-based FMIS. FMIS implementations were last examined by the ANAO in Audit Report No.37 of 1992–1993. This audit focused on the implementation of FINEST in five agencies. The audit identified significant deficiencies relating to the management and effectiveness of FINEST implementations.

1.49 The ANAO has also published a Better Practice Guide on *Security and Control for SAP R/3* to assist Commonwealth Public Sector agencies in ensuring that security considerations and internal controls in the form of 'better practice procedures' within the SAP system are configured or developed correctly.

1.50 ANAO audits have addressed other related issues including relevant elements of the SSS (ANAO Audit Report No.14 1996–1997 *Evaluation Process for the Shared Systems Suite*) and more generally contract and project management in the Commonwealth. These audits have identified a variety of deficiencies and recommended improvements in relation to procurement, contract and project management.

2. Selection

This chapter examines the size of agencies in the Commonwealth peer group relative to the type of FMIS selected. Size of agencies is based on the number of users and transaction processing volume. The chapter also considers the likely whole-of-life costs for different types of FMIS products based on the cost of software licences. It discusses these size and cost metrics in the context of the then OGIT guidance to agencies regarding FMIS selection.

Introduction

2.1 The selection of an appropriate FMIS product is vital to achieving the required implementation outcome for an FMIS replacement project. In order to select an appropriate product an agency will need to understand and prioritise its needs and evaluate the available products against these needs.

2.2 The agency should obtain and thoroughly document its understanding of the current and future business processes that need to be addressed. This will assist the agency to identify its business requirements and develop an appropriate evaluation methodology as precursors to product tendering. The evaluation methodology should be used to assess the suitability of potential FMIS products to determine which product will meet the needs of the agency in the most cost-efficient and effective manner, and provide overall value-for-money.

2.3 The size of the organisation, the nature and complexity of business processes, and whole-of-life product costs should be the key criteria used in the selection process to assess the best value-for-money solution. For the purpose of the benchmark report, the ANAO focused on the following key selection metrics:

- agency size (in terms of number of future concurrent, peak concurrent and distributed computing users);
- volume of transactions (number of dialog steps); and
- whole-of-life product costs.

2.4 A detailed overview of the selection process and a review of the selection practices employed by the eight agencies are reported in the related FCA Audit.

Agency size

2.5 The then OGIT developed selection and implementation guidelines to assist agencies in the selection and implementation of FMIS products included on the SSS. Included in these guidelines was specific advice to agencies to assist them in selecting the most appropriate product from the SSS, based on the agency's size, which was determined by user numbers.

2.6 Two user number measures were established by OGIT for agencies to use as size guidelines and these have been applied to the analysis of agency responses in this benchmarking study. They are:

- concurrent users; and
- distributed computing users (which the ANAO has used as a proxy for total agency employees). This measure was related to HRMIS requirements in the OGIT guidelines, however, it is likely that there would be a strong relationship between the two measures, such that they would produce a similar result when determining an agency's size for the selection of both the FMIS and HRMIS.

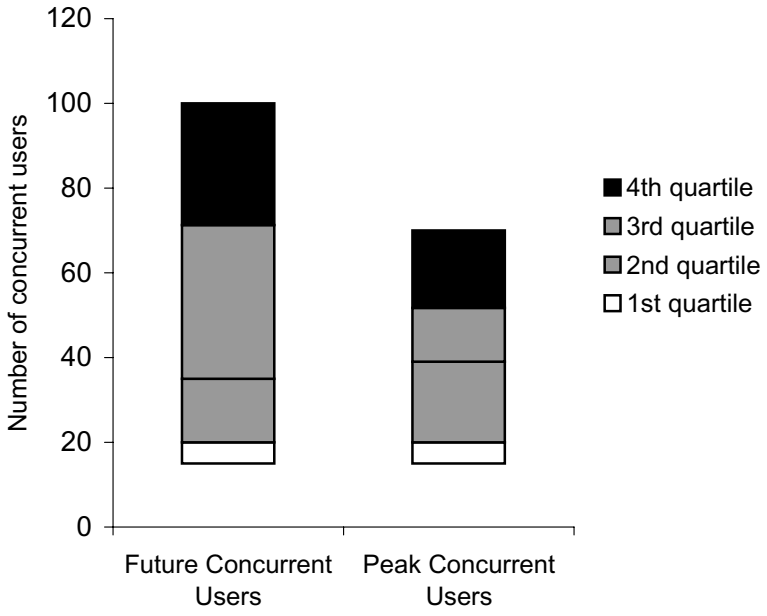
2.7 Agency size was classified by OGIT as either small-sized, medium-sized or large-sized based on the two user number measures as indicated in Table 2.1.

Table 2.1
Agency size criteria

Agency size	Description
Small-sized	• Less than 20 concurrent users; and • Less than 1000 distributed computing users.
Medium-sized	• 20 to 100 concurrent users; and • 1000 to 10 000 distributed computing users.
Large-sized	• 100 to 500 concurrent users; and • Greater than 10 000 distributed computing users.

2.8 Figure 2.1 below illustrates the range in the number of future and peak concurrent users for agencies in the Commonwealth peer group. For 'completed' implementations, the ANAO considers that peak concurrent users (the highest number of concurrent users reported during a month of FMIS production) is a more appropriate measure of agency size than future concurrent users (the planned number of concurrent users of the FMIS when it is fully operational), as the peak concurrent users number represents the actual system users once the system is operational.

Figure 2.1
Number of concurrent users for agencies in the Commonwealth peer group



2.9 The figure indicates that most agencies (75 per cent) had between 20 and 100 future and peak concurrent users and could therefore be considered medium-sized agencies. Peak concurrent user numbers reported by most agencies were generally consistent with the reported future concurrent users. Therefore most agencies could be considered medium-sized. However, 50 per cent of the total Commonwealth group would be more appropriately classified as small-sized agencies for both implementation and production.

2.10 The related FCA Audit indicated most agencies initially over-estimated concurrent user requirements as they did not undertake a comprehensive business needs analysis or business process re-engineering exercise to minimise actual or potential inefficiencies in existing processes. The likely cause of this problem was that agencies did not adequately differentiate between concurrent and other users of the system. Therefore the ANAO considered the number of distributed computing users to be a better indicator of agency size.

2.11 Table 2.2 shows the size classification of the benchmarked Commonwealth agencies, based on the application of OGIT's size guidelines to user numbers illustrated in Figure 2.1.

Table 2.2
Size and number of Commonwealth agencies in benchmark study

Size of Agency	Number of Agencies
Small-sized	4
Medium-sized	3
Large-sized	1
Total	**8**

Product type and agency size

2.12 Three different FMIS products were selected by the agencies in the study. For the purposes of presenting study results, the products have been labelled Product 1, 2 and 3. The products and size of the organisation most likely[23] to select the product are listed below in Table 2.3. For example, Product 2 is more likely to be selected by a large-sized agency. However, some small and medium-sized organisations may select this product if the product's functionality is the best fit and value-for-money for the organisation's requirements. Table 2.3 also classifies Products 1, 2 and 3 as either large accounting or Enterprise Resource Planning (ERP) products, or mid-range accounting products.

Table 2.3
Benchmarked FMIS products and agency size

FMIS Product	Size of agency most likely to implement the product	FMIS product type
Product 1	Large-sized	Large accounting / ERP
Product 2	Large-sized	Large accounting / ERP
Product 3	Medium-sized	Mid-range accounting

2.13 Table 2.4 shows the number of agencies, by agency size, that implemented Product 1, 2 or 3.

[23] o*p. cit.*, OGIT, p. 4.

Table 2.4
Size and number of Commonwealth agencies in benchmark study

	Small-sized agency	Medium-sized agency	Large-sized agency	Total
Product 1	1	1	0	**2**
Product 2	2	1	1	**4**
Product 3	1	1	0	**2**
Total	**4**	**3**	**1**	**8**

2.14 Table 2.4 indicates that most of the Commonwealth agencies in the benchmarking study implemented FMIS products that were suited for larger sized agencies. For example, of the four small-sized agencies in the benchmark study, three selected products that are most likely to be selected by a large-sized agency and one selected a product most likely to be selected by a medium-sized agency (refer to Table 2.3). Similarly, only one of the three medium-sized agencies selected an FMIS product that was most likely to be selected by a medium-sized agency (refer to Table 2.3).

Agency transactions

2.15 The level and complexity of business transactions is also an important consideration in the selection process. Agencies should seek to select a product that is not only capable of meeting their functional requirements, but also congruent with the nature, complexity and volume of their processing requirements. Products should be assessed to ensure that they do not offer excess or unnecessarily complex processing capabilities as this will decrease product and cost efficiency.

2.16 'Dialog steps' is a key measure available to agencies to assist in assessing the volume of business transactions within an FMIS. Dialog steps measure the number of screen changes to process a transaction. It should be noted that the number of dialog steps to process a transaction can vary significantly between products.[24] Generally, large accounting or ERP products have a higher number of dialog steps for each transaction than mid-range accounting products as they are more complex products, which offer more advanced functionality in their modules.

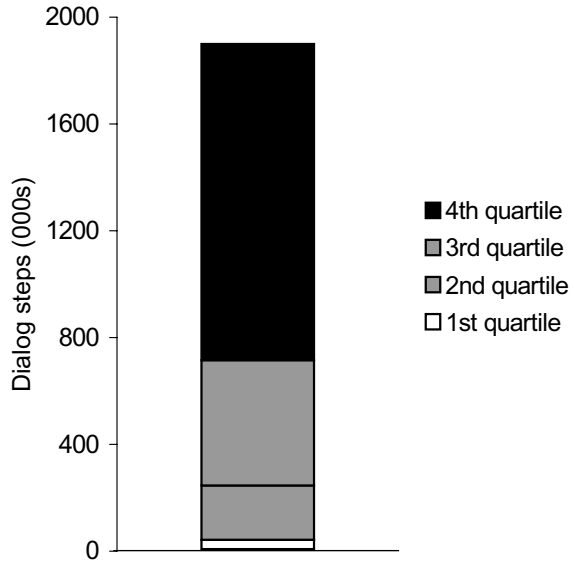
[24] A variation in dialog steps for the same transaction across different products is an indication of the product efficiency and complexity. However, the scope of this study did not explicitly deal with product efficiency as the ANAO did not attempt to establish the number of dialog steps for each transaction in each product.

2.17 The following results are only an indication of the:

- complexity of systems; and
- extent to which agencies were utilising the processing capabilities, particularly processing volume, of their products.

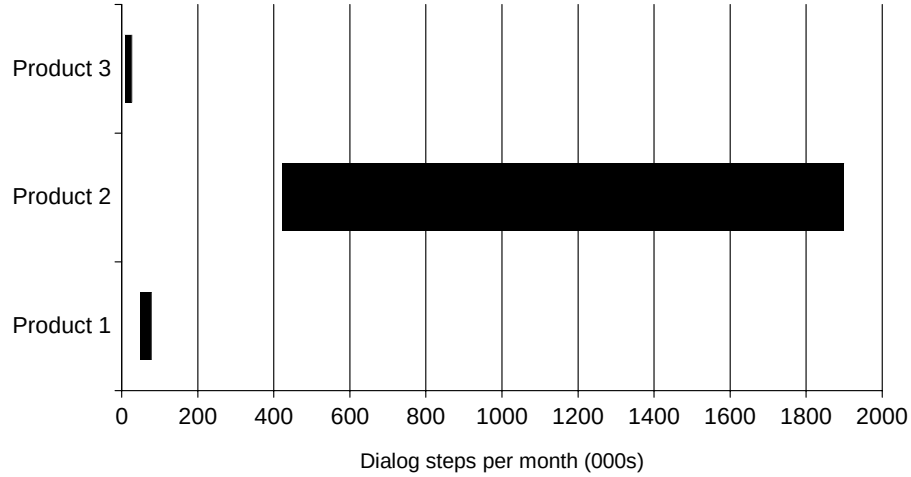
2.18 Figure 2.2 presents the range of dialog steps per month for agencies in the Commonwealth peer group.

Figure 2.2
Dialog steps per month for agencies in the Commonwealth peer group



2.19 The figure shows that there was a large variation in the number of dialog steps. However, there was relatively little variation between the four agencies in the first and second quartiles (dialog steps ranged between 8 000 and 230 000). Whereas, there was a significant variation between the four agencies in the third and fourth quartiles (dialog steps ranged between 400 000 and 1.9 million). This variation was largely driven by products, the influence of which is better illustrated in Figure 2.3.

Figure 2.3
Range of dialog steps per month by product



2.20 Figure 2.3 suggests that Product 2 was the most complex product.

2.21 The agencies that recorded dialog steps at the lower end of the range for their product were generally not achieving high levels of utilisation of their FMIS products. This is best illustrated in relation to Product 2, where dialog steps ranged between 400 000 and 1.9 million.

2.22 The benchmarking study found that for each product, small-sized agencies recorded a lower number of dialog steps than medium and large-sized agencies. Thus the size of the agency also influenced the number of dialog steps and/or the volume of transactions. It is worth noting that the large-sized agency recorded the largest volume of transactions even though it had only implemented 20 per cent of its product's planned operational capacity at the time of the study.

2.23 The related FCA Audit indicated that most agencies had not achieved full utilisation of their system and, as a result, had not operated it in a cost-efficient manner. The audit also found that agencies that did not sufficiently utilise the processing capacity offered by their chosen FMIS product generally did not adequately consider factors such as cost, size, efficiency and complexity when selecting an FMIS product.

Cost comparisons

2.24 The selection stage of an FMIS replacement project involves a number of key processes, including developing a business case, identifying business requirements and risk, and undertaking a procurement process. Integral to each of these processes is the consideration of value-for-money to ensure an appropriate and sustainable selection decision is made.

Product type

2.25 Figures 2.4 and 2.5 show the software licence cost for the three FMIS products as a percentage of the total implementation and FMIS production cost per future/peak concurrent user, respectively, across the Commonwealth peer group.

Figure 2.4
Software licence cost as a percentage of total FMIS implementation cost by product

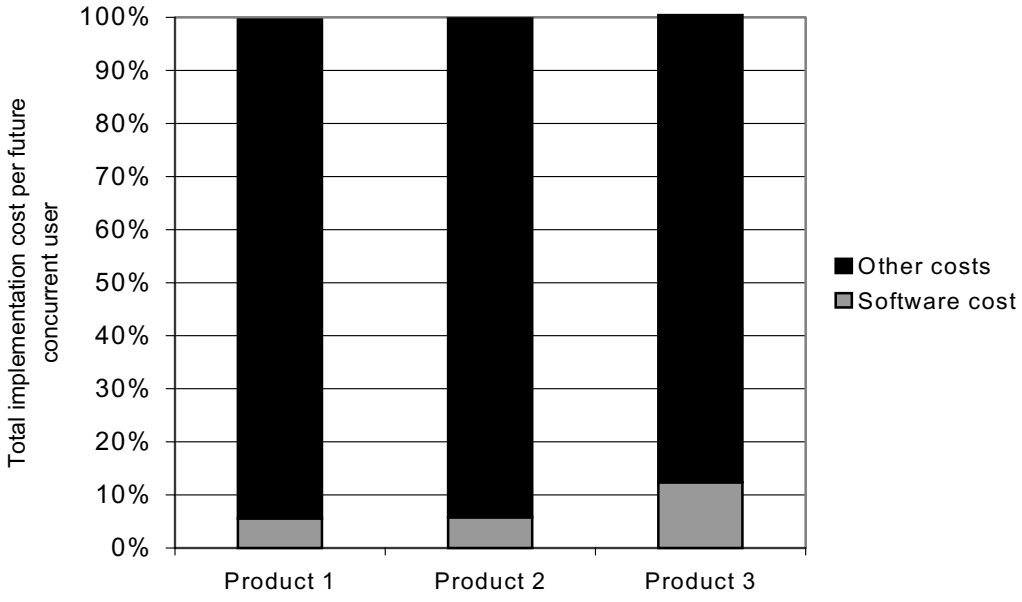
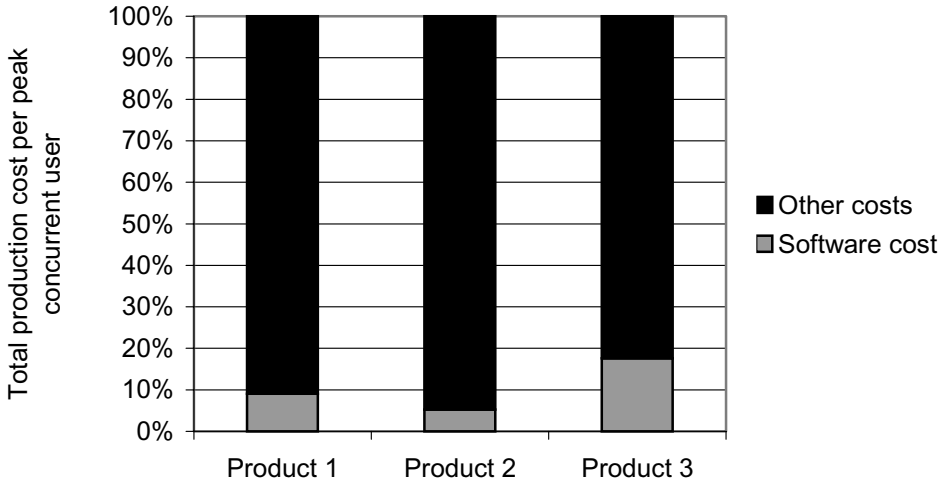


Figure 2.5
Software licence cost as a percentage of total FMIS production cost by product



2.26 These graphs indicate that there is a significant variance in the relationship between software licence and other costs across the products. For example, software licence costs represent approximately 12 per cent of total implementation costs and 18 per cent of total production costs for Product 3. By contrast, software licence costs represent approximately six per cent of total implementation costs and less than 10 per cent of production costs for the other products. These findings are consistent with professional literature which indicates that software licence costs typically represent between five and 15 per cent of total implementation costs[25] depending on product type and agency size.

[25] *SAP and business process re-engineering*, Ian Martin & Yen Cheung, Business Process Management Journal, Vol. 6 No. 2, 2000, p. 118, reported software costs were only 5 per cent of the total SAP implementation costs. *Value Menus: CFO Buyer's Guide to Midrange Accounting Software,* John J.Xenakis, CFO Magazine, March 1999, p. 3 reports that prices for mid-range systems will range from less than $50 000 to $150 000 whereas SAP will range from $50 000 at the base to hundreds of thousands of dollars. *TCO for Packaged Applications —Why Bother Estimating?,* Vinnie Mirchandani, Gartner Strategic Planning Assumption,16 December 1998, reports that the software license cost is just the tip of the iceberg when it comes to implementation and maintenance costs and that the application software portion for many projects may only be 3 to 10 percent of the Total Cost of Ownership (TCO) over a five year life cycle. *TCO for packaged applications: The Building Blocks,* Vinnie Mirchandani, Gartner Tutorials 16 December 1998, indicates that metrics measuring implementation costs relative to costs can be wildly unpredictable because TCO is driven by hundreds of variables. The results of the Gartner benchmark study undertaken in conjunction with the audit indicated that software costs represent between 5 per cent and 15 per cent of FMIS implementation costs.

Figure 2.6
Average software licence cost per future concurrent user by product (FMIS implementation)

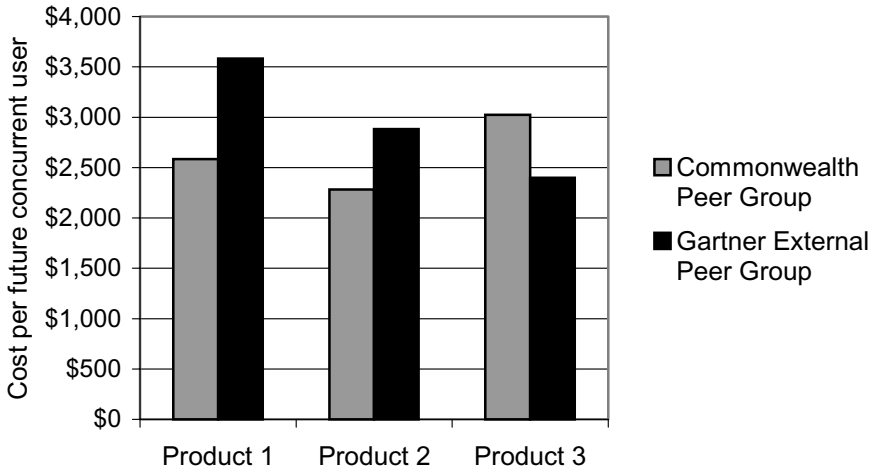
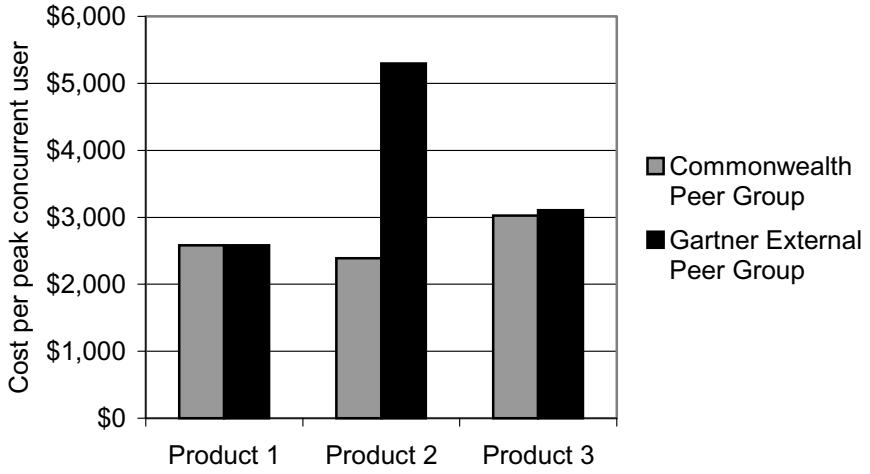


Figure 2.7
Average software licence cost per peak concurrent user by product (FMIS production)



2.27 Figures 2.6 and 2.7 illustrate that there was also a significant variance in the cost of software for FMIS implementation and production across the three products. For example, Product 3 had a higher software cost per user for the

Commonwealth peer group than the other two products, however the higher software cost represented significantly more of the total implementation and production costs (as shown in Figures 2.4 and 2.5). The figures also indicate that the Gartner external peer group generally paid more for software per user than the Commonwealth peer group, and in a number of cases, significantly more. The related FCA Audit indicated that software costs were affected by the extent of contract negotiation undertaken by agencies purchasing products.

2.28 In relation to the Gartner external peer group, the software cost results have changed significantly from FMIS implementation to production. For production, there is relatively little difference between the Commonwealth and Gartner external peer group for Products 1 and 3. The significance of the difference between the two peer groups for Product 2 has increased. The result for Product 2 may be explained by the Commonwealth peer group:

- purchasing less or no software after implementation compared to the Gartner external peer; and/or
- negotiating a better price for new software purchases and software production costs.

2.29 As a result of the relationship between software and other costs, an implementation of an FMIS for 20 concurrent users would cost approximately:

- $922 500 for Product 1;
- $787 500 for Product 2; and
- $488 000 for Product 3.

2.30 Due to the varying relationship between software and other costs the product with the highest software cost per user resulted in a significantly lower implementation cost. The related FCA Audit also found that some of the higher cost per licence products tended to result in a relatively lower total implementation cost and vice versa.

2.31 Analysing software and other costs for FMIS production produces a similar result. For example, annual production costs for an FMIS supporting 20 concurrent users would be approximately:

- $571 000 for Product 1;
- $540 000 for Product 2; and
- $345 500 for Product 3.

2.32 Based on the benchmark results, over a five-year period the product with the highest software licence costs per user (the mid-range accounting product) would cost significantly less than the other products (the large

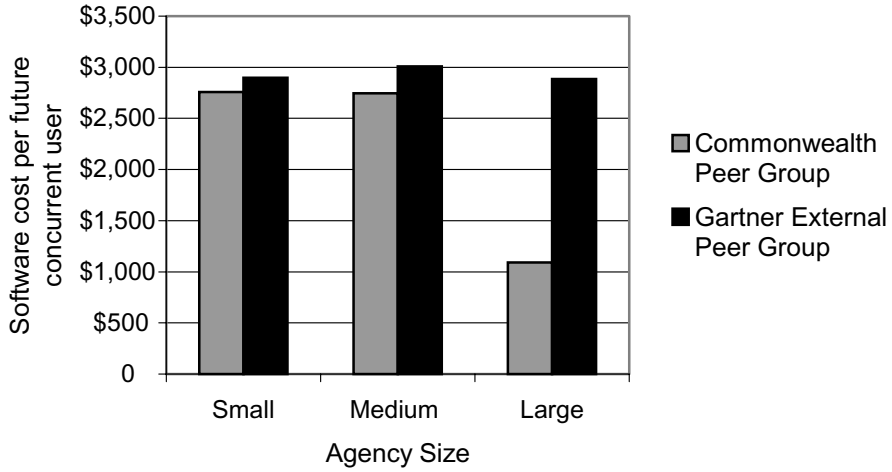
accounting or ERP products). Consistent with the benchmark results the related FCA Audit found that agencies that implemented Product 3 had the lowest implementation and production costs, regardless of agency size. Some agencies were able to achieve relatively low implementation costs per user with Product 2 by adopting phased implementation approaches, however, these agencies generally then experienced relatively higher production costs.

2.33 As a result of the limited assessment of costs and an incomplete understanding of the relationship between software licence costs and other costs by product, agencies significantly underestimated the five-year cost of implementing products that had lower software licence costs (which tended to be some of the larger products). A cost analysis based on software licence costs does not provide a reasonable basis for evaluating value-for-money of alternative solutions.

2.34 The related FCA Audit indicated that a number of agencies limited cost considerations for short-listing and/or selection decisions to software licence costs. In addition, not all agencies ensured that software upgrade costs were included in the contract for production and this may have resulted in a higher cost for these agencies in FMIS production. It is unlikely these agencies would have had a full appreciation of the cost of implementation and production.

Agency size

Figure 2.8
Average software licence cost per future concurrent user for FMIS implementation by agency size

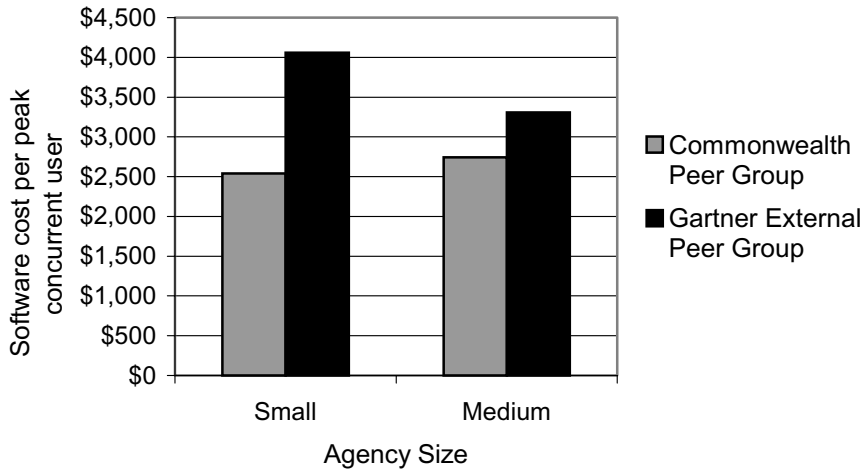


2.35 Figure 2.8 shows that agency size also influenced the cost of software for agencies in the Commonwealth peer group. The figure indicates that the large-sized agency was able to achieve a significantly lower cost of software relative to the small and medium-sized agencies. However, there was little difference between the cost of software for small and medium-sized agencies. It is possible that this was a result of the medium-sized agencies being small medium-sized agencies.

2.36 Analysis of Figure 2.8 suggests that OGIT negotiation of software licence costs may have contributed to the Commonwealth peer group achieving lower software cost per user for agencies of all sizes (OGIT negotiated software prices for products on the SSS for all Commonwealth agencies).

2.37 In particular, it would appear that the large-sized agency in the Commonwealth peer group achieved a significantly lower software cost per user compared to its Gartner external peer, as well as other agencies in the Commonwealth peer group. As there is only one large-sized agency in the study it is difficult, however, to demonstrate a relationship between this outcome and the OGIT negotiation process. The related FCA Audit found that this agency undertook a more rigorous contract negotiation process which contributed to the lower software costs. This suggests that agencies may achieve better outcomes if they apply appropriate management practices within the context of current Government policy.

Figure 2.9
Average software licence cost per peak concurrent user for FMIS production by agency size



2.38 Figure 2.9 shows that similar results were observed in FMIS production. In particular, the Commonwealth achieved a lower software cost per user for both small and medium-sized agencies.

2.39 Overall, the OGIT negotiation process would appear to have contributed to the Commonwealth peer group achieving lower software costs than the Gartner external peer group. However, given the proceeding analysis, agencies needed to be aware of the relationship between software costs and other implementation costs (for whole-of-life) of each product to ensure a value-for-money selection decision was achieved.

Conclusion

2.40 Only two agencies in the benchmarking study selected a product from the SSS that was recommended in OGIT's size guidelines as the most appropriate for their size. Most agencies selected products that were more likely to be selected by a large-sized agency. Inappropriate product selection generally resulted in agencies experiencing problematic implementations, increased implementation costs and functionality deficiencies.

2.41 This study found that, by examining the variation in the number of dialog steps (the measure of transaction processing volume) by product, smaller-sized agencies were generally not achieving high levels of utilisation of their product. In particular, all product types offered additional processing capacity which was not being utilised by most agencies.

2.42 Benchmark results also indicated that the product with the highest software cost (the mid-range accounting product) may have a significantly lower whole-of-life cost. As a result, software costs are only indicative of total implementation and production costs when agencies have a full understanding of the relationship between software and other implementation and production costs for each product.

2.43 Overall, the OGIT negotiation process would appear to have contributed to the Commonwealth peer group achieving lower software costs than those of the Gartner external peer group. However, the results of the benchmarking study and related FCA Audit indicate that some agencies could have achieved better outcomes if they had applied appropriate procurement and project management practices within the context of current Government policy.

3. Implementation

This chapter examines the cost of implementing an FMIS for agencies in the Commonwealth peer group relative to the Gartner external peer group. It considers the cost of FMIS internal, external and other resources. It also considers the size of the implementation team and the time taken to implement.

Introduction

3.1 The implementation phase of the project life-cycle immediately follows product selection. It is likely to be resource intensive, both in respect of internal and external costs, as well as being time critical. Effective management of the implementation is therefore essential to the successful completion of the project. Typically, effective senior management involvement, contract negotiation and management, and project management are essential to the success of the FMIS implementation. These success factors are discussed further in the related FCA Audit Report.

3.2 The benchmark study collected information and examined key metrics about some of the key success factors. Primarily the benchmark study used cost metrics to highlight issues and indicate success. The study also briefly examined time metrics. The interpretation of metrics was supported by the findings from the related FCA Audit.

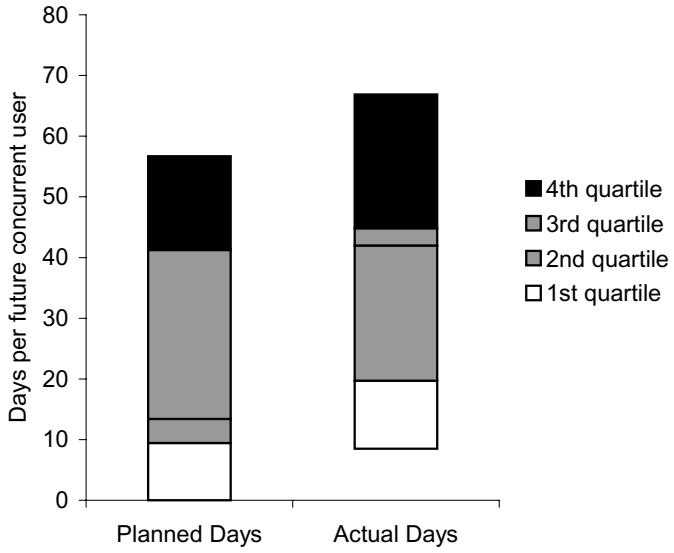
3.3 This chapter specifically discusses aspects of:

- implementation timeframes;
- cost of the FMIS implementation, expressed in terms of:
  - internal resources;
  - external resources;
  - other resources; and
- size and composition of the implementation team.

FMIS implementation timeframes

3.4 The key benchmark developed by Gartner to analyse the implementation timeframes was the number of planned and actual implementation days per future concurrent user. This benchmark facilitated a comparison of agencies' actual to planned implementation days and, therefore, an assessment of whether agencies met their implementation timeframes. However, this benchmark does not provide enough information to assess the efficiency or effectiveness of the implementations.

Figure 3.1
FMIS implementation days per future concurrent user



3.5 Figure 3.1 below shows the range of planned and actual implementation days per future concurrent user for the Commonwealth peer group. Two agencies were unable to provide complete responses for this metric. In addition, there was significant variance in agencies' results for this metric. In general, actual days exceeded planned days.

3.6 Two agencies in the Commonwealth peer group reported that they under-estimated the number of planned implementation days per future concurrent user. Three agencies reported that implementation days per future concurrent user were over-estimated and one agency reported that it achieved its planned number of implementation days per future concurrent user. The remaining agencies reported that they achieved the 'go-live' date within the planned days. There are several factors that were observed during the related FCA Audit which could explain these results, including many agencies not:

- maintaining sufficient records of the implementation phase; and
- achieving all planned functionality by the end of the implementation phase.

3.7 As part of the initial planning for the benchmarking study and related FCA Audit, the ANAO undertook a survey (ANAO Survey) of agencies that implemented a new FMIS. Of the 43 agencies that provided details of the product selection and 'go-live' dates, these agencies took, on average, nine months to implement an FMIS.

Table 3.1
Average FMIS implementation time by product (based on responses to the ANAO Survey)

	Average time (in months) from selection to the 'go live' date	Average time (in months) from the 'go live' date to the 'sign off' date	Average time (in months) from selection to the 'sign off' date
Product 1	13	4	17
Product 2	9	3	12
Product 3	8	1	9
Other Products	8	1	9
All Products	**9**	**2**	**11**

3.8 Table 3.1 provides details, by product, of average time from selection to the 'go-live' date, the 'go-live' date to the 'sign-off' date and selection to the 'sign-off' date.

3.9 The ANAO Survey results identified that eight FMIS products were implemented across the 43 agencies. The shortest average implementation timeframe was five months and the longest average implementation timeframe was 13 months. Of the agencies that had 'signed-off' on their FMIS implementation, the total elapsed time for products ranged between nine and 17 months, on average. By way of comparison, some product vendors indicated that the implementation of their products would take approximately nine to twelve months to complete.

3.10 Three agencies had not 'signed-off' at the time of the survey. Of the 40 agencies that had 'signed-off' on their FMIS implementation, 'sign-off' occurred, on average, two months after the 'go-live' date. Across the eight FMIS products implemented, the shortest average 'sign-off' time was zero months after (at the same time as) the 'go-live' date, and the longest average 'sign-off' time was four months after the 'go-live' date.

3.11 The data presented in Table 3.1 shows that implementations of Product 1 were the longest, while Product 2 implementation efforts were generally longer than Product 3. This means implementations of large accounting or ERP products occurred over a longer period of time than mid-range accounting products.

Table 3.2
Average FMIS implementation time by agency size (based on responses to the ANAO Survey)

	Average time (in months) from selection to the 'go live' date	Average time (in months) from the 'go live' date to the 'sign off' date	Average time (in months) from selection to the 'sign off' date
Small agencies	8	2	10
Medium agencies	9	4	13
Large agencies	12	0	12
All agencies	**9**	**2**	**11**

3.12 Table 3.2 shows that small-sized agencies generally had shorter average implementation elapsed times than medium and large-sized agencies. Detailed examination of these results indicated that there were two exceptions, namely the small-sized agencies that implemented either Product 1 or 2 (that is, large accounting or ERP products) had longer average implementation elapsed times than the medium-sized agencies that implemented these products.

3.13 Of the 33 agencies that responded to the ANAO Survey, which were implementing an FMIS between November 1996 and December 1999, 26 or more agencies were concurrently implementing systems between June 1997 and November 1998. Of the three different FMIS products selected by the agencies in the Commonwealth peer group, all had concurrent implementations occurring within this period. The related FCA Audit found that concurrent implementations of a product generated considerable pressure on the availability of skilled contract and other resources for Commonwealth agencies.

3.14 In addition, as most agencies' implementation efforts overlapped it is likely that there was limited opportunity for agencies to reduce implementation timeframes and/or cost through benefiting from lessons learnt during other implementations of the products.

3.15 Agencies that implemented Product 2 after November 1998, or Product 1 or 3 after May 1999, may have been able to reduce timeframes and cost through access to more highly skilled contract resources and by benefiting from the lessons learnt from previous implementations of the product.

3.16 The related FCA Audit found that most agencies in the Commonwealth peer group established optimistic implementation timeframes of between three

and six months when planning the implementation project. As problems were encountered and delays experienced, some agencies assigned a higher number of implementation staff to the project in an attempt to achieve implementation deadlines. However, the ANAO notes that increasing project staff numbers did not remove the timeframe pressures of an optimistic 'go-live' date. As a result, project teams did not undertake critical steps in the selection and implementation process. In addition, by establishing optimistic timeframes agencies did not allow themselves time to adequately assess and fine-tune implementation outcomes, which resulted in increased FMIS production costs (this is discussed further in the following chapter).

FMIS implementation resource metrics

3.17 A major success factor with any FMIS implementation is the efficient and effective management of project resources. This is critical to ensuring the implementation timeframe and budget are achieved and that the implemented FMIS meets the agency's information and business functionality requirements.

3.18 The complexities of the selected products and the implementation process makes it inappropriate to rely on any single benchmark to measure the performance of agencies' FMIS implementations. The following metrics provide a foundation upon which agencies can begin to assess the performance of their implementations. Two types of implementation metrics were considered in this study and have been categorised as cost and allocation metrics (refer to Table 3.3). These metrics were derived by Gartner.

Table 3.3
Types of implementation metrics

FMIS implementation metric types	Metrics
Cost of resources	**Key metric** Cost[26] per future concurrent user. **Other metrics** Internal resource cost[27] per future concurrent user. External resource cost[28] per future concurrent user. Other resource cost[29] per future concurrent user. Cost per FTE.[30]
Allocation of resources	Senior management cost per future concurrent user. Ratio of internal to external implementation resources. Ratio of future concurrent users per FTE.

3.19 The above metrics were examined in terms of the result for:

- the whole Commonwealth peer group relative to the Gartner external peer group;
- each product implemented by the Commonwealth peer group relative to the Gartner external peer group. The Gartner external peer group did not necessarily implement the same product as the Commonwealth peer group instead, it implemented similar functionality and was of a similar size to its Commonwealth peer; and/or, where appropriate,
- each agency size in the Commonwealth peer group relative to the Gartner external peer group.

[26] The implementation cost includes the total of occupancy, software, management, external consultants and outsource, internal business staff, external IT staff and internal IT staff. It excludes all infrastructure, training and other costs of implementation.
[27] The internal resource cost includes the total of management, internal business staff and internal IT staff.
[28] The external resource cost includes external consultants and outsource, and external IT source.
[29] The other resource cost includes occupancy and software.
[30] Full-time equivalents (FTE) is a measurement that calculates the total logical number of FMIS implementation staff. It is calculated by counting the number of days (including all leave and administration time) taken by implementation staff to complete an implementation activity.

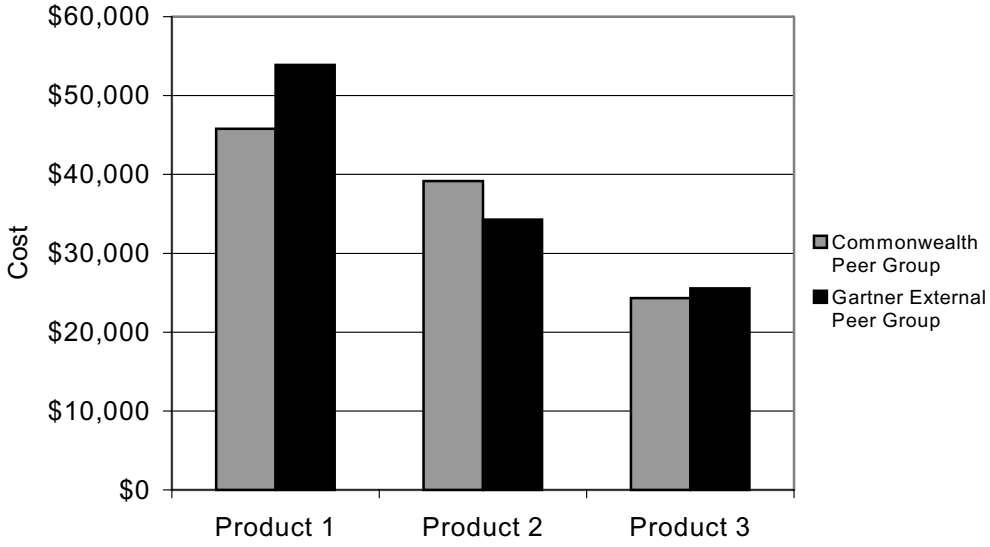
Cost per future concurrent user

3.20 The cost per future concurrent user metric represents the total FMIS implementation expenditure (that is, the sum of all FMIS implementation cost areas, but excluding IT infrastructure and training) divided by the number of future concurrent users. Dividing total expenditure by the number of future concurrent users provides a basis for meaningful comparisons between agencies and peer groups. Future concurrent user numbers is used as the basis for measurement as an implementation effort is designed to achieve a system that services the planned (future) number of concurrent users.

3.21 The average cost per future concurrent user, at approximately $37 000, for the Commonwealth peer group and the Gartner external peer group was not significantly different.

Figure 3.2

Average cost per future concurrent user by product (FMIS implementation)



3.22 Figure 3.2 shows the implementation cost per future concurrent user for each FMIS product. The agencies in this study that implemented Products 1 or 3 recorded, on average, a lower implementation cost per future concurrent user compared to their Gartner external peer group. Specifically, agencies from the Commonwealth peer group that implemented Product 1 had an average implementation cost per future concurrent user of $45 800 which was significantly less than their external peer group's average cost of $53 900. Agencies from the Commonwealth peer group that implemented Product 3 had an average implementation cost per future concurrent user of $24 300 which was not significantly less than their Gartner external peer group's average cost

of $25 500. However, agencies from the Commonwealth peer group that implemented Product 2 had, on average, a significantly higher implementation cost per future concurrent user of $39 200 than the Gartner external peer group's average cost of $34 200.

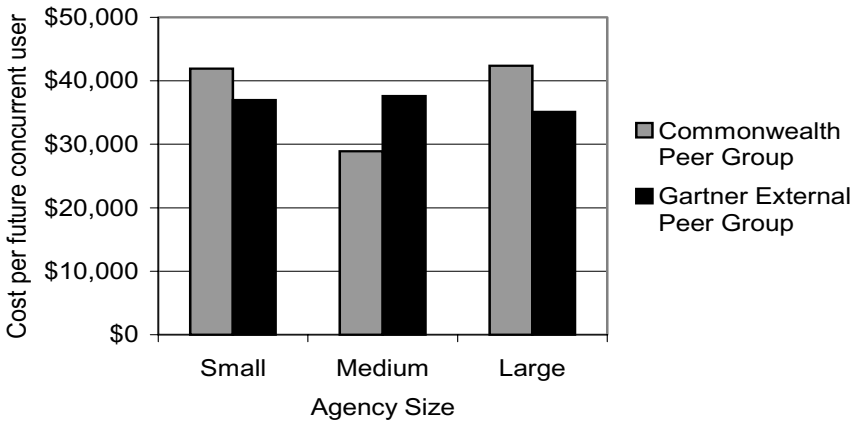
3.23 The related FCA Audit indicated that in most cases inadequate planning and management of implementation tasks explained the higher costs and, as a result, the implementations were relatively more expensive. In other cases some agencies had more complex implementation requirements that needed more resources or more highly skilled resources to be applied to the implementation effort, which increased implementation costs.

3.24 The lower costs recorded by Commonwealth peer group agencies that implemented Product 1 and 3 may be an indication that these agencies:

- adequately planned for their implementation tasks or costs; and/or
- had less complex implementation requirements that needed less resources or less highly skilled resources to be applied to the implementation effort (although this is less likely given the basis upon which Gartner selected peers for Commonwealth agencies).

3.25 However, the related FCA Audit found that the lower cost was associated with applying insufficient resources to achieve implementation objectives.

Figure 3.3
Average cost per future concurrent user by agency size (FMIS implementation)



3.26 Figure 3.3 shows the cost per future concurrent user, by agency size, for the Commonwealth and Gartner external peer groups. The figure indicates that both small and large-sized agencies from the Commonwealth peer group

had, on average, higher implementation costs per future concurrent user than their Gartner external peers. Whereas the medium-sized agencies had, on average, a significantly lower implementation cost per future concurrent user than the Gartner peer group. In addition, within the Commonwealth peer group the small and large-sized agencies had, on average, significantly higher cost implementations than the medium-sized agencies. While the results reported in Chapter 2 in relation to the cost of software licensing indicated that OGIT negotiated lower cost software for all agency sizes, this cost reduction had only a limited impact on the overall cost of implementation.

3.27 There were a number of reasons for variations in cost per future concurrent user within the Commonwealth peer group. For example, the related FCA Audit found that the implementation cost recorded by some agencies was higher relative to their peers as they:

- had more comprehensive cost allocation systems;
- undertook comprehensive business re-engineering activities;
- customised aspects of the selected product during implementation;
- sought to implement more, or a higher level of, functionality; and
- adopted an implementation approach which sought to achieve most planned functionality by the initial 'go-live' date rather than adopt a phased approach.

3.28 The audit also found that the larger products proved more costly to implement as they were more complex and required more highly skilled resources to be involved in the implementation process.

3.29 In addition, most of the Commonwealth peer group agencies in the study did not keep sufficient records of their FMIS implementation costs and the information provided in the graphs may understate actual implementation costs.

3.30 The audit found that there was a significant variance between agencies in relation to the success of the implementation outcome. In most cases, the initial implementation effort did not achieve all of the requirements of an agency. As a result, these agencies had to invest further resources in the FMIS after the 'go-live' date to achieve planned requirements.

Cost of resources (FMIS implementation)

3.31 The cost of internal and external resources applied to an FMIS implementation is a key factor when considering the success of the FMIS implementation outcome. In addition, the distribution of costs between internal and external resources generally indicates the degree of ownership of the solution

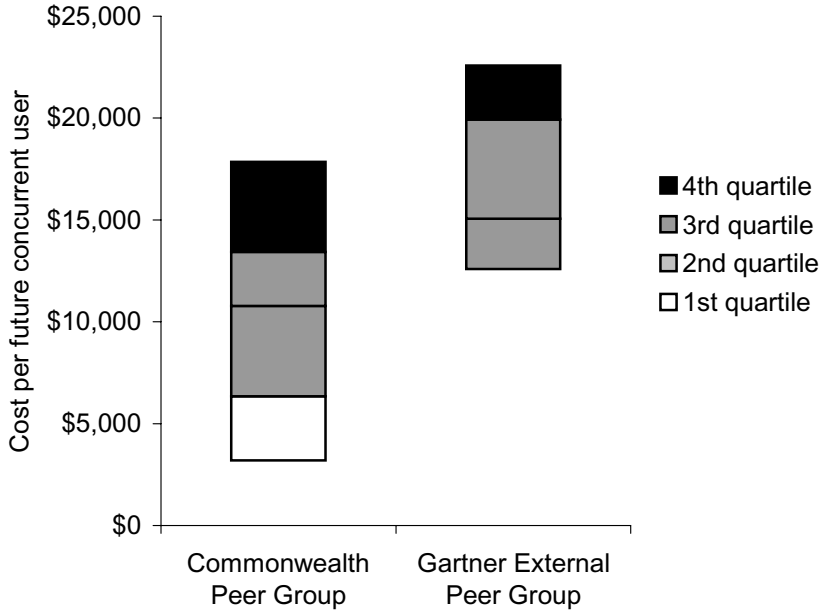
by the agency, the level of system and business process knowledge of internal staff, and the degree of dependence on external consultants. These factors are also indicative of the complexity of the solution.

3.32 Table 3.3 provided details of the three primary implementation metrics considered in this section, which included:

- internal costs per future concurrent user;
- external costs per future concurrent user; and
- cost per FTE.

3.33 Other costs per future concurrent user for FMIS implementation was comprised of the cost of software and occupancy.[31] Only two Commonwealth peer group agencies recorded the cost of occupancy and the Gartner external peer group did not record any costs for occupancy. As a result, an analysis of other costs would involve an analysis primarily of software costs which have already been analysed in Chapter 2 (refer to Figures 2.6 and 2.8).

Figure 3.4
Internal resource cost per future concurrent user (FMIS implementation)



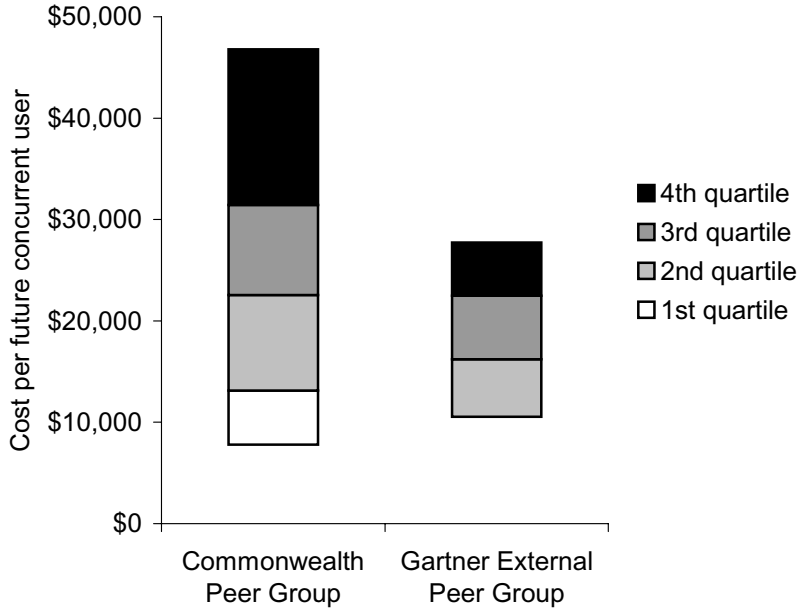
[31] Occupancy costs are the fully burdened cost of the facilities used by the FMIS team. Facilities include: office space, furniture, electricity, maintenance, property taxes, security and office supplies.

3.34 Figure 3.4 shows the range of internal resource costs per future concurrent user for the Commonwealth and Gartner external peer groups. The figure illustrates that even though the variation in the cost per user of internal resources by agencies in the Commonwealth peer group was greater than the Gartner external peer group, agencies in the Commonwealth peer group generally spent less on internal resources during implementation. Approximately three-quarters of the Commonwealth peer group (or six agencies) spent less than $14 000 per future concurrent user on internal resources compared to three-quarters of the Gartner external peer group which spent between $14 000 and $20 000 on internal resources.

3.35 The possible consequences of lower internal resource costs per user for agencies include:

- a reduction in the level of internal ownership and knowledge of the new system; and
- an increased level of reliance on external resources.

Figure 3.5
External resource cost per future concurrent user (FMIS implementation)



3.36 The range of external resource costs per future concurrent user for FMIS implementations by the Commonwealth and Gartner external peer groups are shown in Figure 3.5. The figure shows that there was a greater variation in the cost of external resourcing for agencies in the Commonwealth peer group than the Gartner external peer group. In addition, some agencies in the

Commonwealth peer group spent significantly more on external resources than their Gartner external peer. Approximately 50 per cent (four) of the agencies in the Commonwealth peer group spent more than $28 000 per future concurrent user on external resources, while the Gartner external peer group spent between $10 500 and $28 000 per future concurrent user on external resources. This suggests that a number of agencies in the Commonwealth peer group placed a relatively high level of reliance on external resources during their implementations.

3.37 The benchmark results indicated that approximately 65 per cent of the Commonwealth peer group's implementation expenditure related to the cost of external resources compared with the Gartner external peer group result of 47 per cent. In addition, only 27 per cent of the Commonwealth peer group's implementation expenditure related to the cost of internal implementation resources compared with the Gartner external peer group result of 45 per cent.

3.38 A key factor that may have contributed to Commonwealth peer group agencies spending more on external resources during implementation was the FMIS product selected. Figure 3.2 on page 56 indicated that there were significant differences in the cost of implementation per future concurrent user depending on the product implemented.

Table 3.4
FMIS implementation costs (percentage of total) by cost classification and product

Cost Classification	Group	Product 1 (Percent of Resources)	Product 2 (Percent of Resources)	Product 3 (Percent of Resources)
Internal resources	Commonwealth	11	31	51
	Gartner external peer	42	45	49
External resources	Commonwealth	85	62	37
	Gartner external peer	51	47	41
Other resources	Commonwealth	4	7	12
	Gartner external peer	7	8	10
Total cost by group		**100**	**100**	**100**

3.39 Table 3.4 indicates that Commonwealth peer group agencies that implemented Products 1 and 2 (that is a large accounting or ERP product) were more reliant on external resources during their implementation efforts. These agencies spent significantly more on external implementation resources (85 per cent and 62 per cent respectively of total resource cost for implementation) than

on internal resources (11 per cent and 31 per cent respectively of total resource cost for implementation). These Commonwealth peer group agencies were also relatively more reliant on external resources than their Gartner external peer group, where the distribution of implementation costs between internal and external resources was approximately the same.

3.40 This comparison combined with findings outlined in the related FCA Audit, strongly suggest that some Commonwealth peer group agencies selected a complex FMIS product, and found that they lacked the requisite skills and experience required to implement the chosen product.

3.41 Another key factor that may have contributed to Commonwealth peer group agencies spending more on external resources during implementation was the size of the agency. Figure 3.3 on page 57 indicated that there were significant differences in the cost of implementation per future concurrent user depending on the agency size.

Table 3.5
FMIS implementation costs (percentage of total) by cost classification and agency size

Cost Classification	Group	Small (Percent of Resources)	Medium (Percent of Resources)	Large (Percent of Resources)
Internal resources	Commonwealth	28	27	31
	Gartner external peer	45	45	43
External resources	Commonwealth	64	62	66
	Gartner external peer	47	47	49
Other resources	Commonwealth	8	11	3
	Gartner external peer	8	8	8
Total cost by group		**100**	**100**	**100**

3.42 Table 3.5 indicates that the Gartner external peer group consistently spent approximately 45 per cent of its total implementation budget on internal resources and 47 per cent on external resources. In comparison, the Commonwealth peer group consistently spent 30 per cent of their total implementation budget on internal resources and 60 per cent on external resources. These results indicate that agency size did not affect the level of reliance on external resources.

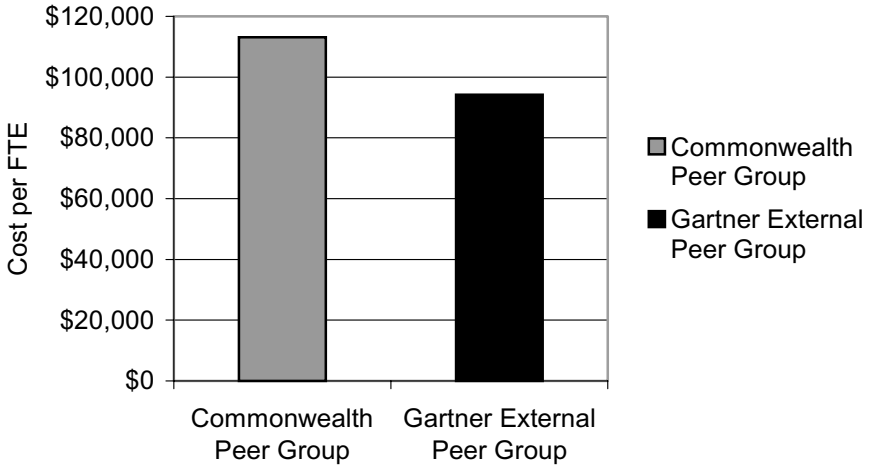
3.43 A key threat to agencies arising from their high reliance on external resources, combined with the relatively low level of internal resource involvement during the implementation, was the loss of corporate knowledge.

If an agency has relied heavily on the external resources, knowledge of the agency's FMIS is likely to vest with them rather than the agency's own resources.

3.44 Some agencies engaged low cost and/or inexperienced external resources as a result of contractor shortages. These agencies generally had relatively more costly and less successful implementation outcomes than the other agencies in the Commonwealth peer group and have found themselves more reliant on external resources during FMIS production (refer to next chapter for further discussion). The main reasons identified for the continued reliance on external resources was the complexity of the product selected and the lack of product knowledge transfer from the external to the internal resources due to internal resource shortages.

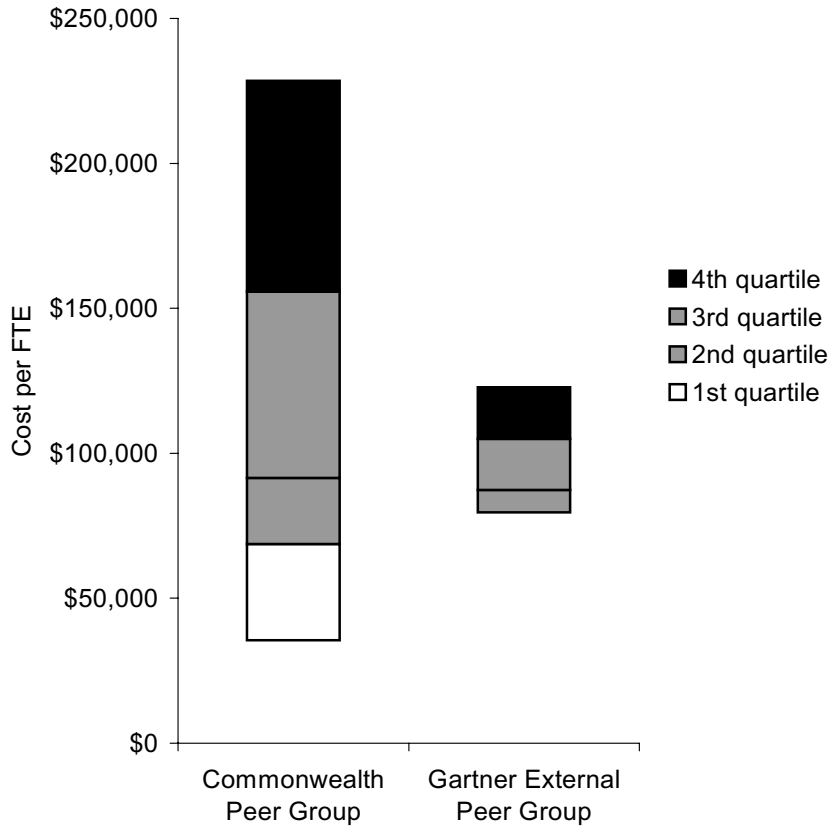
3.45 The related FCA Audit found that agencies in the Commonwealth peer group generally did not maintain comprehensive records of contracts and their associated costs. As a consequence, it is possible that the cost of resources, particularly for external resources, may be higher than indicated above.

Figure 3.6
Average cost per FTE (FMIS implementation)



3.46 Figure 3.6 shows the average cost per FTE for the Commonwealth and the Gartner external peer groups. The Commonwealth peer group spent an average of $113 000 on implementation FTEs compared to the Gartner external peer group average of $95 000. However, as the FTE number excludes the implementation partner's project staff it is not a complete indication of project team size. In addition, the related FCA Audit found that all costs associated with the project staff (internal and external) were not recorded.

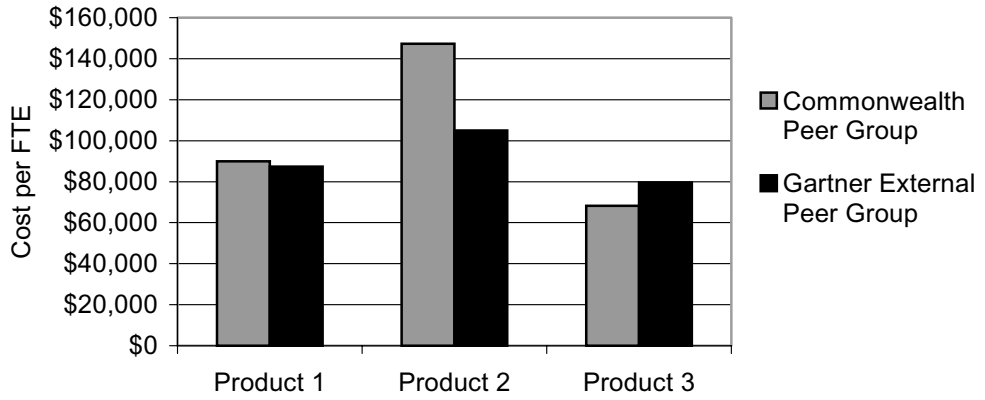
Figure 3.7
Cost per FTE (FMIS implementation)



3.47 Figure 3.7 shows the variation in the range of cost per FTE for the Commonwealth and Gartner external peer groups. On average the Gartner external peer group cost per FTE ranged between $80 000 and $130 000 for the FMIS implementation project teams. In comparison the Commonwealth peer group had a much wider range, suggesting a differing approach to resourcing the team.

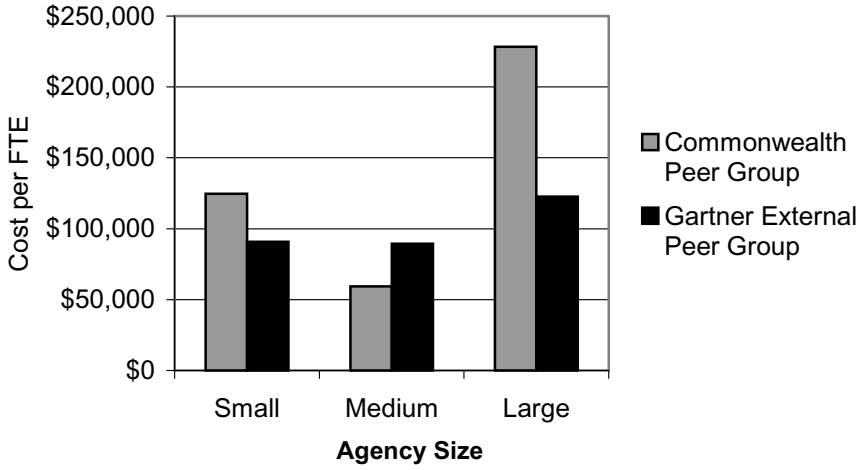
3.48 The above figure must be considered in conjunction with other factors such as whether internal or external resources were used, agency size, and/or the complexity of the product chosen. It is likely that some of the more complex products and/or larger-sized agencies used more highly skilled resources for the implementation and this consequently increased the cost per FTE. However, the related FCA Audit found that some agencies did not apply appropriately skilled staff to their implementations as they had difficulty accessing appropriately skilled internal staff, while other agencies accessed the required skills by using more external resources.

Figure 3.8
Average cost per FTE by product (FMIS implementation)



3.49 Figure 3.8 illustrates that there were significant differences between the cost per FTE for the implementation of different products. Product 2 had the highest cost per FTE, and Product 3 (the mid-range accounting product) had the lowest cost per FTE. Specifically, the figure indicates that the Commonwealth peer group average cost per FTE was greater than the Gartner external peer group for Products 1 and 2 (the large accounting or ERP products).

Figure 3.9
Average cost per FTE by agency size (FMIS implementation)



3.50 Figure 3.9 illustrates that there were significant differences between the cost per FTE for implementations by agencies of different sizes. The large-sized agency had the highest cost per FTE, and the medium–sized agencies had the lowest cost per FTE. Specifically, the figure indicates that the Commonwealth peer group average cost per FTE was significantly greater than for the Gartner external peer group for small and large-sized agencies.

Size and composition of FMIS implementation team

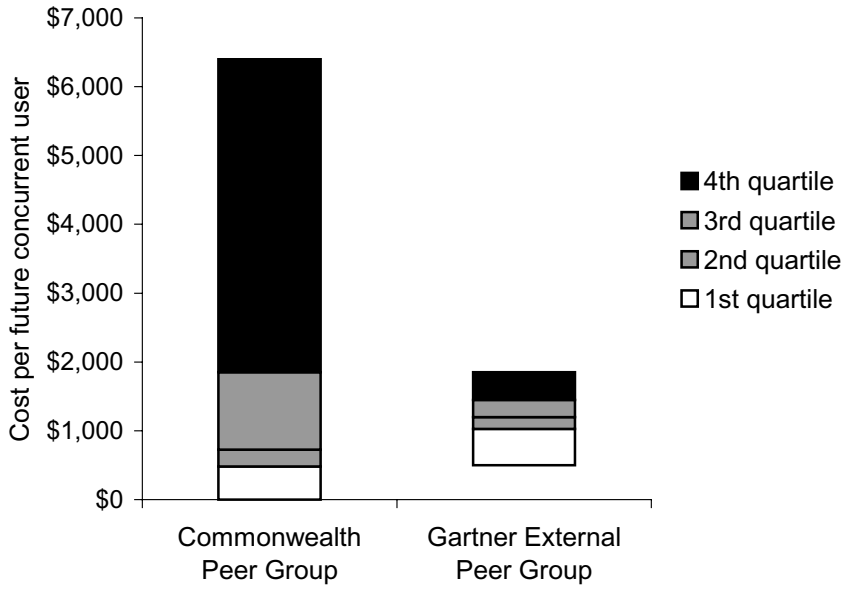
3.51 A balanced implementation project team is extremely important to the success of an FMIS implementation, as well as for the maintenance of a stable FMIS production environment. For the purposes of this study, balance in the implementation team will arise when there is a sufficient mix of internal and external resources. In addition, an appropriate level of senior management, line management and end user commitment is also required.

3.52 The implementation team composition and size is typically different than the FMIS administration (production) team. Generally more staff (ranging from senior management to user) are required during the implementation stage as this stage includes the system planning, design, construction, configuration and testing of the product.

Senior management

3.53 A key component of a successful FMIS implementation is the level and nature of senior management involvement. Senior management of an agency should oversee the implementation effort by establishing a representative and pro-active FMIS Steering Committee to guide and support the FMIS implementation project team. In order to conduct a successful implementation an agency needs to ensure it adequately plans for this phase and dedicates sufficient skilled resources (both accounting and product implementation experts) to its implementation effort.

Figure 3.10
Senior management cost per future concurrent user (FMIS implementation)



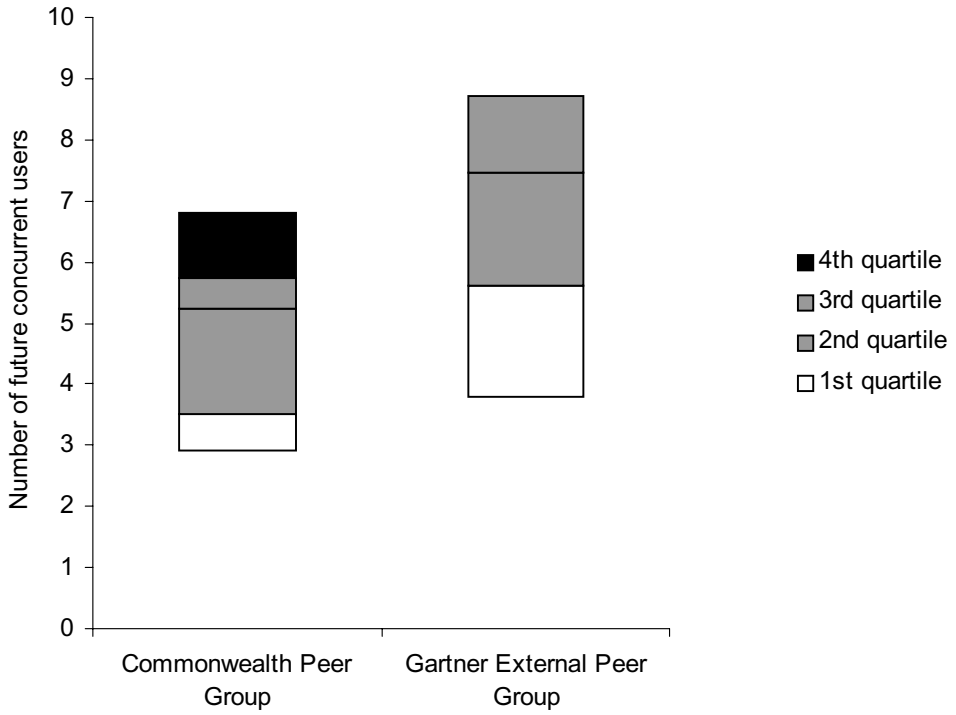
3.54 Figure 3.10 shows the large variation in the range of senior management cost per future concurrent user for agencies in the Commonwealth and Gartner external peer group. Four agencies from Commonwealth peer group fell outside the Gartner external peer group range for the cost of senior management involvement.

3.55 The range of expenditure on senior management demonstrated the different implementation approaches of the agencies in the Commonwealth peer group (with respect to the level of senior management involvement). Specifically, some agencies undertook an implementation which sought to achieve most required functionality by the 'go-live' date with minimal input from senior management. In comparison, other agencies undertook a phased implementation approach by seeking to implement a base level of functionality by the 'go-live' date and then implement more functionality after the 'go-live' date with a consistent level of input from management.

3.56 The related FCA Audit found that agencies in the Commonwealth peer group that had a higher level of senior management involvement (supported by a higher senior management cost per future concurrent user) generally achieved a relatively more successful implementation outcome. Reasons for this included clear system ownership, project direction, assignment of adequate resources and timely resolution of project issues. However, these agencies spent significantly more than their Gartner external peer group.

Size of FMIS implementation team

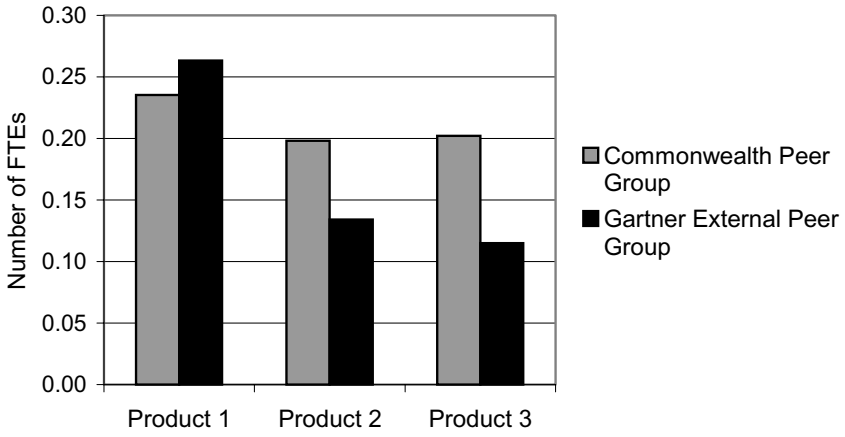
Figure 3.11
Number of future concurrent users per FTE (FMIS implementation)



3.57 The Commonwealth peer group had an average of five future concurrent users per FTE for implementation compared to the Gartner external peer group average of seven. Figure 3.11 indicates that the Commonwealth peer group had fewer users per FTE relative to the Gartner external peer group.

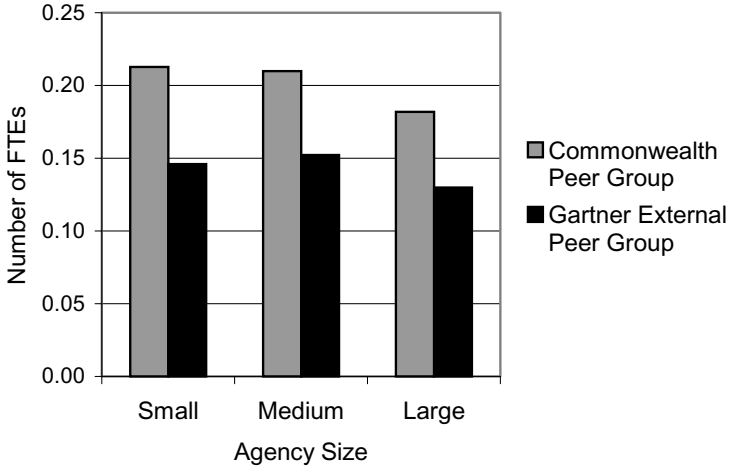
3.58 Analysis of this in conjunction with the results for cost per FTE (Figures 3.6, 3.7 and 3.8), indicates the Commonwealth peer group had relatively larger implementation teams with more expensive and more external resources than the Gartner external peer group.

Figure 3.12
Average number of FTE per future concurrent users by product (FMIS implementation)



3.59 Figure 3.12 indicates that agencies that implemented Product 1 provided a higher level of support per user relative to the other products. However, the Gartner external peer group provided an even higher level of support. Whereas agencies that implemented Products 2 and 3, provided less support per user, but provided significantly more support than the relevant Gartner external peer group. Implementation resources applied to Products 1 and 2 were generally more expensive than the Gartner external peer group, and Product 2 implementers applied more resources than the Gartner external peer group which contributed to a higher implementation cost per user.

Figure 3.13
Average number of FTE per future concurrent users by agency size (FMIS implementation)



3.60 Figure 3.13 indicates that small and medium-sized agencies provided a higher level of support per user relative to the large-sized agency. In addition, the Commonwealth peer group generally provided a higher level of support than the Gartner external peer group for all agency sizes.

Conclusion

3.61 ANAO Survey results indicated that at least 33 agencies had implemented an FMIS since the announcement of the SSS for FMIS products. This placed an enormous amount of pressure on the available implementation resources during this period.

3.62 Implementations took, on average, nine months from product selection to the initial 'go-live' date of the FMIS solution. Agencies that were smaller in size and/or implemented mid-range accounting products generally had shorter implementation elapsed times than agencies that were larger in size and/or implemented large accounting or ERP products. The size of the FMIS product implemented had the greatest influence on the elapsed implementation time. However, medium-sized agencies that implemented large accounting systems or ERPs (Product 1 or 2), on average, had shorter elapsed implementation times than small-sized agencies that implemented these products.

3.63 The timeframe results appear to have been influenced by the number of implementations that were occurring concurrently in the Commonwealth budget sector. In particular, the number of concurrent implementations reduced the ability of agencies to find contractors with requisite product/implementation skills and/or minimised the ability to learn from previous implementations. The complexity of the product and/or the complexity of the agency's requirements also influenced implementation elapsed times.

3.64 Overall, the Commonwealth peer group cost per future concurrent user for implementation was slightly higher than for the Gartner external peer group result. However, based on an analysis of agency size and product type, agencies from the Commonwealth peer group that were medium-sized and/or had implemented Product 1 or 3, on average, had a lower implementation cost relative to their Gartner external peer group. In addition, agencies within the Commonwealth peer group that were medium-sized and/or had implemented Product 3 (the mid-range accounting product), on average, had significantly lower implementation costs.

3.65 The related FCA Audit found that, in general, the larger products proved more costly to implement as they were more complex and required more highly skilled resources to be involved in the implementation process. In addition,

there was a significant variance in the success of implementations and functionality achieved by the 'go-live' date.

3.66 Reasons identified in the audit for the variation in the cost of implementation were numerous, including:

- some agencies had better cost monitoring and allocation systems;
- some agencies sought more complex functionality or customised aspects of their system during implementation, thus increasing implementation costs; and/or
- some agencies adopted a phased implementation approach which only sought to achieve a subset of required functionality by the initial 'go-live' date, thus reducing implementation costs.

3.67 In general, agencies within the Commonwealth peer group had greater variation in the cost of internal resources, external resources and FTEs for implementation relative to their Gartner external peer group.

3.68 The agencies in the Commonwealth peer group had relatively larger implementation teams and, on average, paid more for the implementation team FTEs. In particular, those agencies from the Commonwealth peer group that were small and medium-sized had the largest implementation teams, and those agencies that implemented Product 2 paid their implementation teams more.

3.69 OGIT's negotiation of a maximum price for software with the product vendors on the SSS is likely to have contributed to most agencies incurring lower software costs which is discussed in Chapter 2. However, these savings in the cost of software did not sufficiently offset for agencies from the Commonwealth peer group, that were small in size and/or implemented large accounting products and ERPs, from the costs associated with the relatively:

- longer implementation elapsed timeframes;
- higher cost of external resources;
- high level of reliance placed on external resources; or
- larger implementation teams.

4. Production

This chapter examines the annual cost of maintaining the FMIS for agencies in the Commonwealth peer group relative to the Gartner external peer group. It considers the cost of FMIS internal, external and other resources. It also considers the level of support offered to users after implementation.

Introduction

4.1 In order to maintain the FMIS adequately after implementation, an agency needs to devote sufficient and appropriately skilled resources to the FMIS production team as well as develop, document and apply a comprehensive FMIS management plan that schedules periodical reviews of the system's functionality against changing business requirements. Other policies and procedures should be developed to support the FMIS management process including guidelines on change management, risk management and training. Activities associated with this phase of the FMIS life-cycle have been combined under the heading of FMIS production for the purposes of this study. FMIS production management is discussed further in the related FCA Audit Report.

4.2 The nature and cost of activities associated with FMIS production are influenced by an agency's selection and implementation processes. The more appropriate the product choice, and the more diligent the implementation approach, the greater the likelihood that the FMIS will be both suitable for the agency's needs and stable in production. This will reduce the amount of time, effort and cost in FMIS production.

4.3 The complexities of the management of an FMIS in production make it inappropriate to rely on any single benchmark to measure the performance of an agency's FMIS production environment. The benchmark study collected information and examined key metrics related to the management of an FMIS in production. The following metrics are considered to provide a foundation upon which agencies can begin to assess the performance of their FMIS production activities. Consistent with the previous chapter, the study primarily examined cost metrics to highlight issues and indicate success of the management activities (refer to Table 4.1 below). Allocation metrics were also considered. These metrics were derived by Gartner. The interpretation of the metrics is supported by findings from the related FCA Audit.

Table 4.1
Gartner key production metrics

Production metric types	Metrics
FMIS cost of resources	***Key metrics***
	Cost per peak concurrent user.
	Application server cost per peak concurrent user.
	Other metrics
	Internal resource cost per peak concurrent user.
	External resource cost per peak concurrent user.
	Other resource cost per peak concurrent user.
	Cost per FTE.
Allocation of resources	Senior management cost per peak concurrent user.
	Ratio of internal to external production resources.
	Ratio of peak concurrent users per FTE.

4.4 These metrics were examined in terms of the result for:

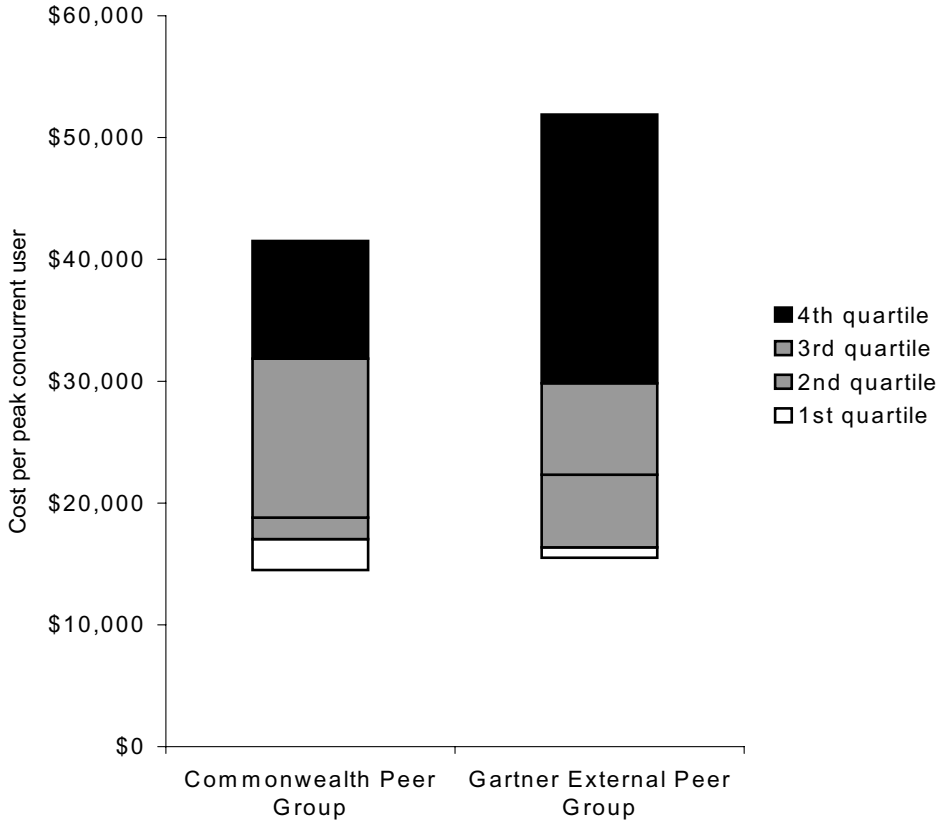
- the whole Commonwealth peer group relative to the Gartner external peer group;
- each product implemented by the Commonwealth peer group relative to the Gartner external peer group. The Gartner external peer group did not necessarily implement the same product as the Commonwealth peer group instead, it implemented similar functionality and was of a similar size to its Commonwealth peer; and/or, where appropriate,
- each agency size in the Commonwealth peer group relative to the Gartner external peer group.

4.5 At the time of the study, one of the Commonwealth peer group agencies had not completed its FMIS implementation. As a result, this agency did not provide cost information for the purpose of analysing FMIS production performance.

FMIS production resource metrics

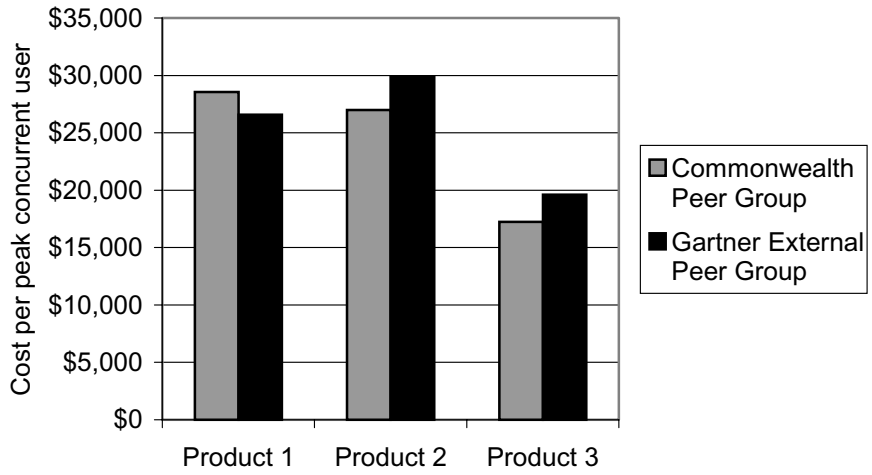
4.6 The cost per peak concurrent user metric represents the total annual FMIS production expenditure (that is the sum of all the FMIS production cost areas, excluding IT infrastructure and training) divided by the number of peak concurrent users. This metric provides a basis for meaningful comparisons between agencies and peer groups as FMIS production effort is designed to achieve a system that services the peak (largest) number of users logged onto the system concurrently during a month of FMIS production activity.

Figure 4.1
Cost per peak concurrent user (FMIS production)



4.7 The average FMIS production cost per peak concurrent user for the Commonwealth peer group and the Gartner external peer group was not significantly different at approximately $26 000. However, Figure 4.1 shows that the Gartner external peer group has greater variation in the FMIS production cost per peak concurrent user, and generally had a slightly higher cost per user, than did the Commonwealth peer group.

Figure 4.2
Average cost per peak concurrent user by product (FMIS production)



4.8 Figure 4.2 shows the average FMIS production cost per peak concurrent user for each of the FMIS products examined in the study. The Commonwealth peer group agencies that were using Product 2 or 3 recorded a significantly lower average production cost per peak concurrent user than their Gartner external peer group. However, the Commonwealth peer group agencies that were using Product 1 recorded a higher average production cost per peak concurrent user than the Gartner external peer group.

4.9 The ANAO noted that Commonwealth agencies that implemented Product 3 (the mid-range accounting product) had a consistently lower cost per concurrent user for both implementation and production relative to their Gartner external peer group. Whereas, agencies from the Commonwealth peer group that implemented Product 1 or 2 (the large accounting or ERP products), reversed their results from implementation to production.

4.10 It is likely the higher costs in FMIS production for Product 1 are the result of some costs being deferred from implementation to production. Conversely, it may indicate that these agencies have not adequately resourced their FMIS production activities given their requirements.

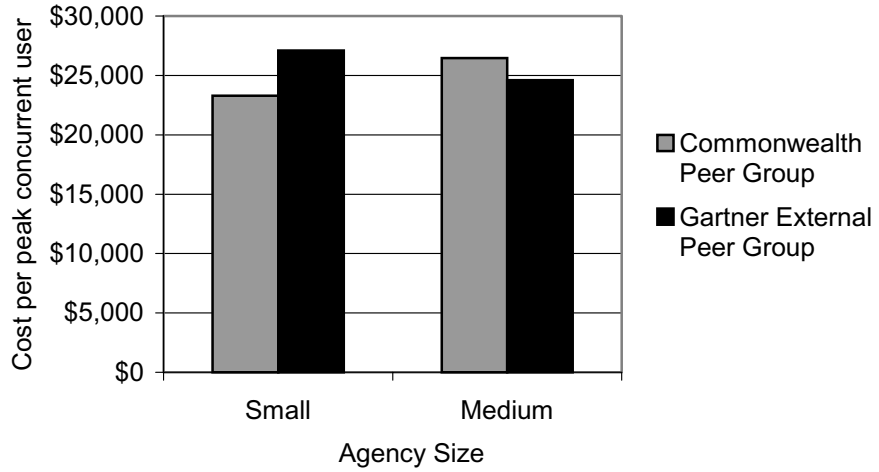
4.11 The related FCA Audit found that, in relation to FMIS production costs, there was:

- no relationship between ongoing implementation activities and higher FMIS production costs for agencies that implemented Product 1. In fact, the agency that was not undertaking remedial activities had a significantly higher FMIS production cost. In addition, the agency with lower FMIS production cost was not investing sufficient effort in addressing system problems;

- a relationship between ongoing implementation activities (or remedial activities) and correspondingly higher FMIS production costs for agencies that implemented Product 2; and
- no relationship between ongoing implementation activities and higher production costs for Product 3. In fact the agency that needed to address functionality gaps was investing sufficient effort in addressing system problems at the time of the audit. The other agency had implemented the product appropriately and was stable in production.

4.12 The related FCA Audit found that the relatively lower implementation and production costs recorded by agencies that implemented Product 3 may be a reflection that the FMIS was more appropriate for the agencies' size and business needs.

Figure 4.3
Average cost per peak concurrent user by agency size (FMIS production)

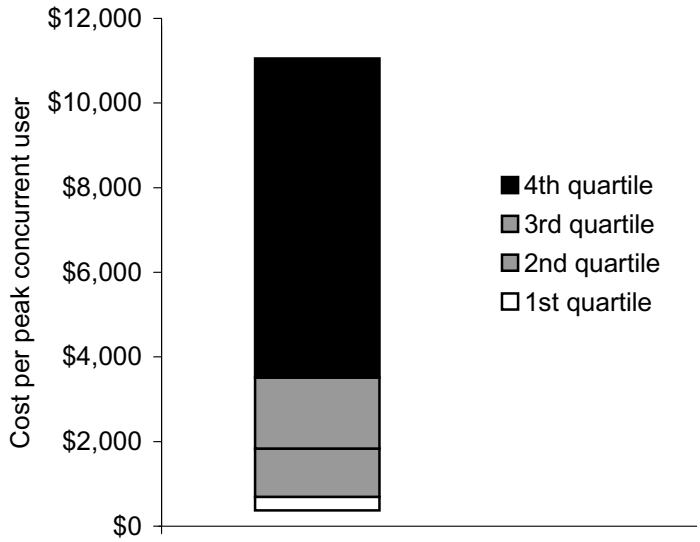


4.13 Figure 4.3 shows the average FMIS production cost per peak concurrent user for small and medium-sized agencies examined in the study. The small-sized agencies from the Commonwealth peer group recorded a significantly lower average FMIS production cost per peak concurrent user than their Gartner external peer group. However, the medium-sized agencies from the Commonwealth peer group recorded a higher average FMIS production cost per peak concurrent user than the Gartner external peer group. This result is the reverse of the FMIS implementation results (refer to Figure 3.3 on page 57). This may suggest that medium-sized agencies generally deferred relatively more of their implementation activities until after the system 'go-live' date than small-sized agencies.

4.14 The related FCA Audit indicated that many of the Commonwealth peer group agencies did not keep sufficient records of FMIS production costs. Therefore, the information provided in the graphs may under-state actual production costs. However, the ANAO also recognises that the FMIS production costs recorded by agencies were likely to be higher in the initial period following 'go-live', as the agencies sought to achieve all required functionality and fine tune their implemented systems.

4.15 The audit also found that some of the agencies were having difficulties in achieving a stable and fully functional FMIS. These difficulties were primarily the result of unresolved problems that arose during the selection and/or implementation processes (such as inadequate specification of business requirements and insufficient internal staff training), combined with a low level of spending on resources during FMIS production.

Figure 4.4
Application server cost per peak concurrent user



4.16 Figure 4.4 shows the application server cost per peak concurrent user for the Commonwealth peer group. Gartner's external peer group did not provide information for their application server costs. Most agencies (86 per cent) in the Commonwealth peer group had an application server cost of between $400 and $4 000 per peak concurrent user. Variations within this range related to the age and robustness of the application server technology used to support the FMIS.

4.17 A number of agencies purchased or leased new application server technology to satisfy software, processing and/or storage requirements. For

example, some agencies with large FMIS products generally need multiple servers to handle processing requirements of the FMIS. The additional servers resulted in a higher application server cost for these agencies. Some agencies also devoted significant additional resources to maintaining their existing or new application servers given the increased processing and storage requirements resulting from the implementation of an FMIS.

Cost of resources (FMIS production)

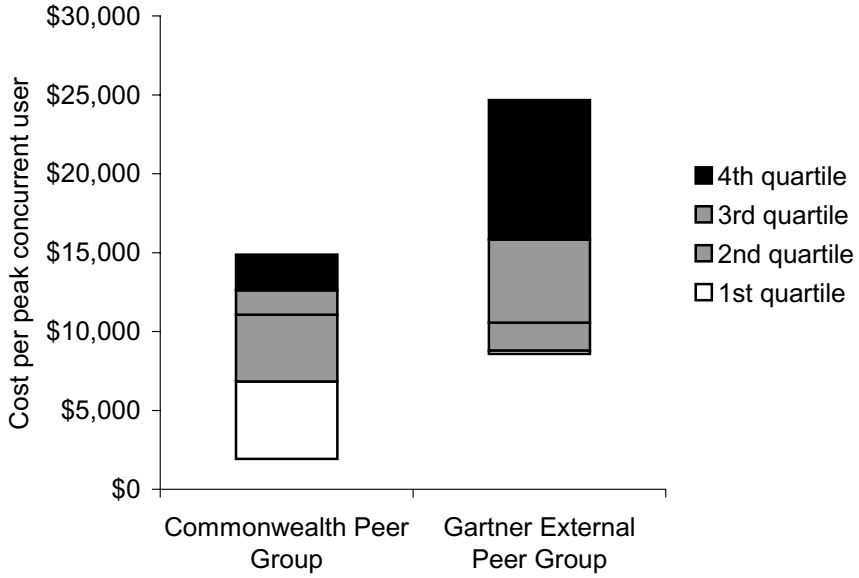
4.18 The cost of internal and external resources applied to FMIS production is a key factor when considering the efficiency and effectiveness of FMIS management. In addition, the distribution of costs between internal and external resources often indicates the degree of ownership of the solution by the agency, the level of system and business process knowledge of internal staff, and the degree of dependence on external consultants. These factors are also indicative of the complexity of the solution.

4.19 Table 4.1 provided details of the three primary production metrics considered in this section, which were:

- internal costs per peak concurrent user;
- external costs per peak concurrent user; and
- cost per FTE.

4.20 Other costs per future concurrent user for FMIS production was comprised of the cost of software and occupancy. Only two Commonwealth peer group agencies recorded the cost of occupancy and the Gartner external peer group did not record any costs for occupancy. As a result, an analysis of other costs would involve an analysis primarily of software costs which have already been analysed in Chapter 2 (refer to Figures 2.7 and 2.9).

Figure 4.5
Internal resource cost per peak concurrent user (FMIS production)

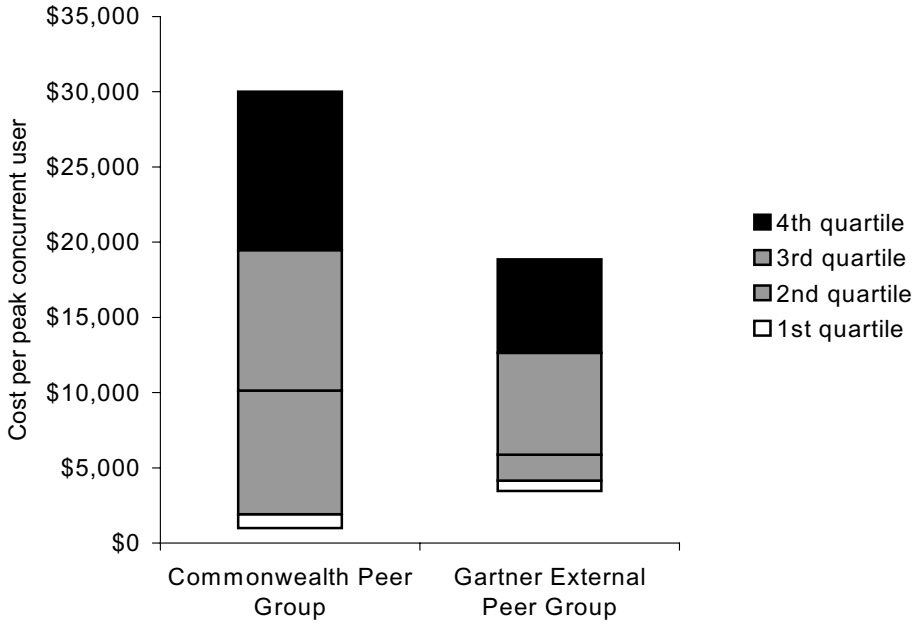


4.21 Figure 4.5 shows the range of internal resource costs (in FMIS production) per peak concurrent user for the Commonwealth and Gartner external peer groups. The figure illustrates that the size of the cost range for both peer groups was comparable. However, consistent with the results for implementation, the Commonwealth peer group generally spent less on internal resources for FMIS production than the Gartner external peer group.

4.22 The possible consequences of lower internal resource costs per user for agencies include:

- a reduction in the level of internal ownership and knowledge of the new system; and
- an increased level of reliance on external resources.

Figure 4.6
External resource cost per peak concurrent user (FMIS production)



4.23 Figure 4.6 shows the range of external resource costs (in FMIS production) per peak concurrent user for the Commonwealth and Gartner external peer groups. The figure shows that there was a greater variation in the cost of external resourcing for agencies in the Commonwealth peer group than the Gartner external peer group. In addition, some agencies in the Commonwealth peer group spent significantly more on external resources than their Gartner external peer group. This suggests that a certain level of external support is required to maintain an FMIS in production. Consistent with the findings in Chapter 3, Commonwealth peer group agencies chose to place a higher level of reliance on external resources to undertake their FMIS production than those agencies in the Gartner external peer group.

4.24 Overall, the benchmark results indicate that approximately 49 per cent of the Commonwealth peer group's FMIS production costs related to external resources compared to the Gartner external peer group result of 35 per cent. Only 38 per cent of the Commonwealth peer group's FMIS production expenditure related to the cost of internal resources compared to the Gartner external peer group result of 51 per cent.

4.25 Another key factor that may have contributed to the Commonwealth peer group agencies spending more on external FMIS production resources was the FMIS product selected. Figure 4.2 on page 75 indicated that there were significant differences in the cost of annual FMIS production cost per peak concurrent user, depending on the product implemented.

Table 4.2
FMIS production expenditure (percentage of total) by cost classification

Cost Classification	Group	Product 1 (Percent of resources)	Product 2 (Percent of resources)	Product 3 (Percent of resources)
Internal resources	Commonwealth	15	40	76
	Gartner external peer	44	62	65
External resources	Commonwealth	76	51	7
	Gartner external peer	46	25	19
Other resources	Commonwealth	9	5	17
	Gartner external peer	10	13	16
Total cost by group		**100**	**100**	**100**

4.26 Another key factor that may have contributed to Commonwealth peer group agencies spending more on external resources during FMIS production was the size of the agency. Figure 4.3 on page 76 indicated that there were significant differences in the cost of annual production per future concurrent user depending on the agency size.

4.27 Table 4.3 indicates that agency size did not significantly affect the level of reliance on external resources.

Table 4.3
FMIS production costs (percentage of total) by cost classification and agency size

Cost Classification	Group	Small (Percent of resources)	Medium (Percent of resources)
Internal resources	Commonwealth	41	36
	Gartner external peer	54	47
External resources	Commonwealth	46	52
	Gartner external peer	30	40
Other resources	Commonwealth	13	12
	Gartner external peer	16	13
Total cost by group		**100**	**100**

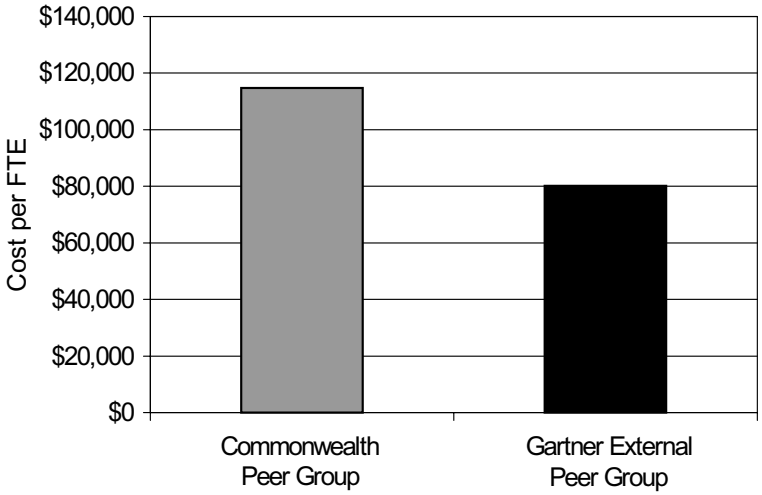
4.28 For the purposes of this study, the appropriate balance in the FMIS production team will be achieved when there is a sufficient mix of internal and external resources. However, the related FCA Audit indicated that most agencies in the Commonwealth peer group relied heavily on external resources during FMIS production. This was generally a result of:

- the high level of dependence these agencies had placed on external resources during their implementation efforts;
- the low level of internal resource involvement and inadequate transfer of system skills from external resources to internal resources during implementation; and/or
- agencies not achieving a significant proportion of the required functionality by the 'go-live' date . As discussed in the previous chapter, the Commonwealth peer group had a high level of dependence on external resources for implementation activities therefore agencies implementing functionality after the 'go-live' date would be likely to have relatively high external resource costs.

4.29 In addition, the audit found that some of the agencies from the Commonwealth peer group were experiencing problems with functionality that had been implemented. Most agencies found it necessary to undertake extensive remedial work during FMIS production. The extra expenditure was predominantly incurred through hiring contract staff and consultants (external resources) with the necessary skills to undertake remedial activities as a sufficient skills base for internal staff was not established during implementation.

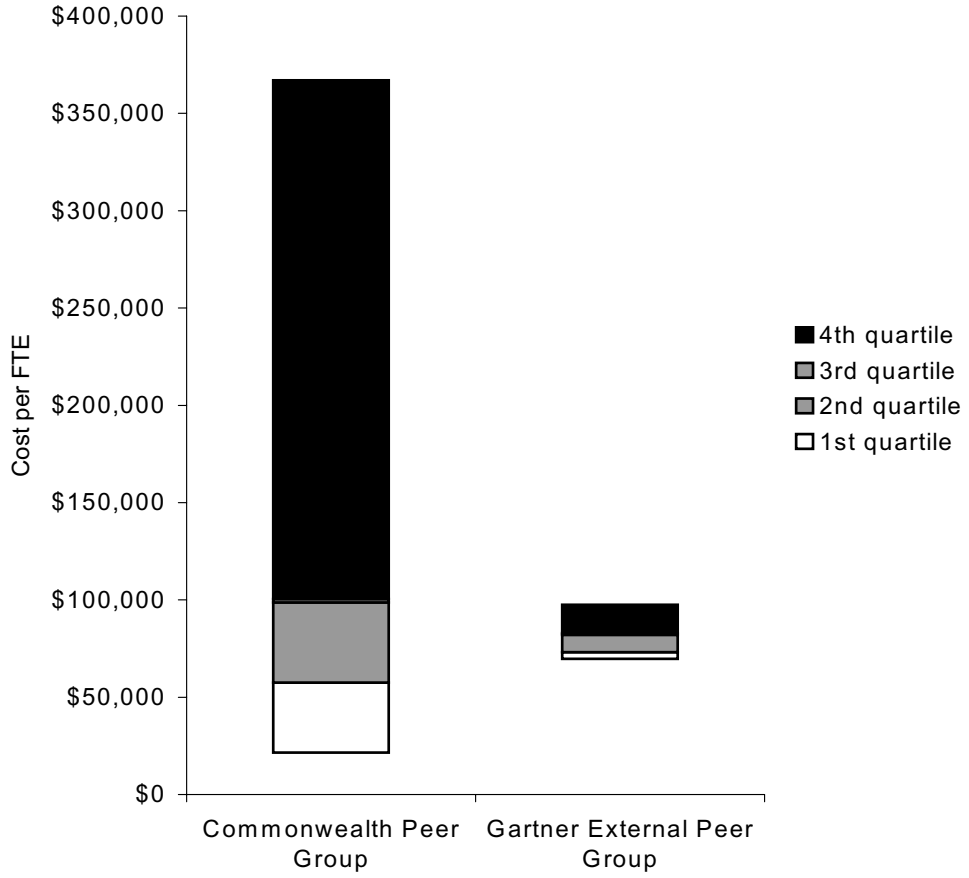
4.30 Another audit finding was that most agencies experienced a high degree of turnover of the implementation staff in the twelve months following implementation. This created a knowledge gap that agencies addressed in the short-term by hiring more external resources.

Figure 4.7
Average cost per FTE (FMIS production)



4.31 Figure 4.7 shows that the Commonwealth peer group spent an average of $114 000 on FMIS production FTEs compared to the Gartner external peer group average of $80 000. However, the FTE number may exclude some contract staff involved in FMIS production. In addition, the related FCA Audit found that not all costs associated with project staff (internal and external) were recorded.

Figure 4.8
Cost per FTE (FMIS production)



4.32 Figure 4.8 shows the variation in the range of cost per FTE (in FMIS production) for the Commonwealth and Gartner external peer groups. Consistent with the results for implementation, the figure shows that there was a greater variation in the cost per FTE for the Commonwealth peer group for FMIS production.

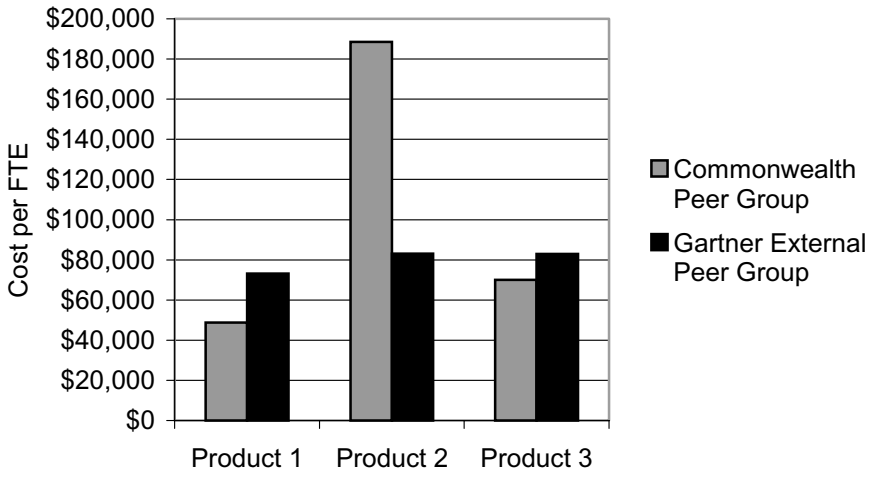
4.33 On average, the Gartner external peer group cost per FTE ranged between $70 000 and $100 000 for FMIS production teams. In comparison, the Commonwealth peer group exhibited a much wider range, suggesting differing approaches had been adopted in resourcing the teams.

4.34 The above figure should also be considered in conjunction with other factors such as whether internal or external resources were used, agency size, and/or the complexity of the product chosen. It is likely that some of the more complex products and/or larger agencies would require more expert resources

for FMIS production and this would consequently increase the cost per FTE. However, the related FCA Audit found that some agencies had difficulty accessing appropriately skilled internal staff for production of their system, while other agencies accessed the required skills by using more external resources.

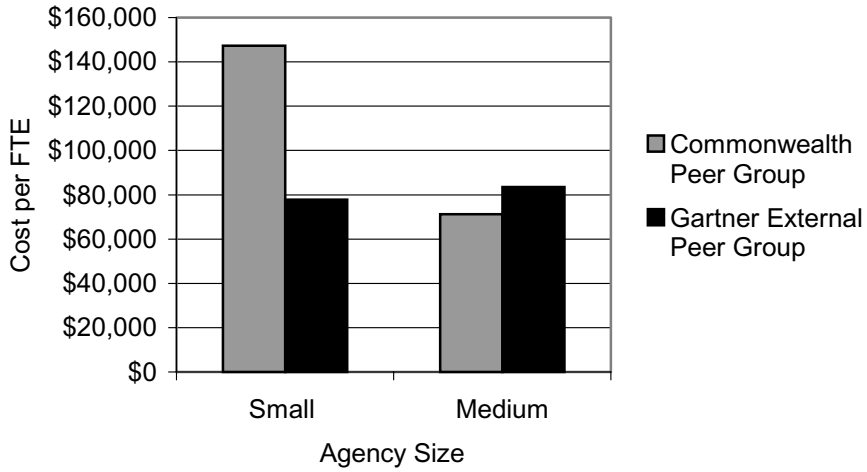
4.35 The audit also found that the two agencies with the highest results for cost per FTE from the Commonwealth peer group were undertaking significant implementation or remedial work during FMIS production. Both agencies also had placed a high level of reliance on external staff.

Figure 4.9
Average cost per FTE by product (FMIS production)



4.36 Figure 4.9 illustrates that there were significant differences between the cost per FTE in FMIS production for the different products. Product 2 had the highest cost per FTE, and Product 1 had the lowest cost per FTE. In addition, the figure indicates that the Commonwealth peer group average cost per FTE was significantly less than the Gartner external peer group for Products 1 and 3.

Figure 4.10
Average cost per FTE by agency size (FMIS production)



4.37 Figure 4.10 illustrates that there were also significant differences between the cost per FTE in FMIS production for agencies of different sizes. The small-sized agencies had the highest cost per FTE, and, consistent with the results for implementation, the medium–sized agencies had the lowest cost per FTE for FMIS production.

Size and composition of FMIS production team

4.38 A balanced FMIS production team is extremely important for the successful maintenance of a stable, reliable and relevant FMIS in production. For the purposes of this study, balance in the FMIS production team will arise when there is a sufficient mix of internal and external resources. In addition, an appropriate level of senior management, line management and end user commitment is also required.

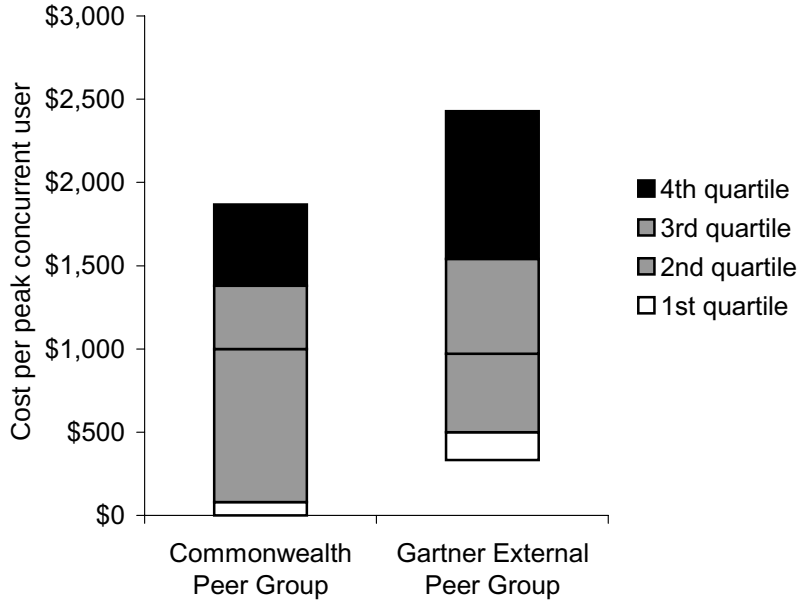
4.39 The FMIS production team composition and size is typically different from the FMIS implementation team. Generally fewer staff (ranging from senior management to user) are required during the production stage, as FMIS production is usually limited to ensuring the system is operational, available, accurate and current. This should be a less complex and resource intensive task than FMIS implementation. In some cases agencies may implement new functionality or upgrade the system, this may increase the size of the FMIS production team for a period of time.

Senior management

4.40 As discussed in the previous chapter, senior management involvement is a key requirement for a successful FMIS production environment. Senior management should be primarily concerned with ensuring that the system is included in strategic and operational planning considerations and that the system achieves required outcomes. Through planning and review exercises, senior management determines the level of involvement based on the status of the system and makes available sufficient resources to undertake the necessary changes to the system to maintain its ongoing relevance, accuracy and stability.

4.41 The related FCA Audit found that Commonwealth peer group agencies that initially experienced problems after the 'go-live' date and exhibited a higher, and more active, level of senior management involvement generally achieved a relatively more stable FMIS outcome.

Figure 4.11
Senior management cost per peak concurrent user (FMIS production)



4.42 Figure 4.11 shows the variation in the range of senior management cost per peak concurrent user (in FMIS production) for the Commonwealth and Gartner external peer groups. In general, the Commonwealth peer group had a lower cost of senior management involvement than the Gartner external peer

group. Three agencies from the Commonwealth peer group fell below the Gartner external peer group range for the cost of senior management involvement.

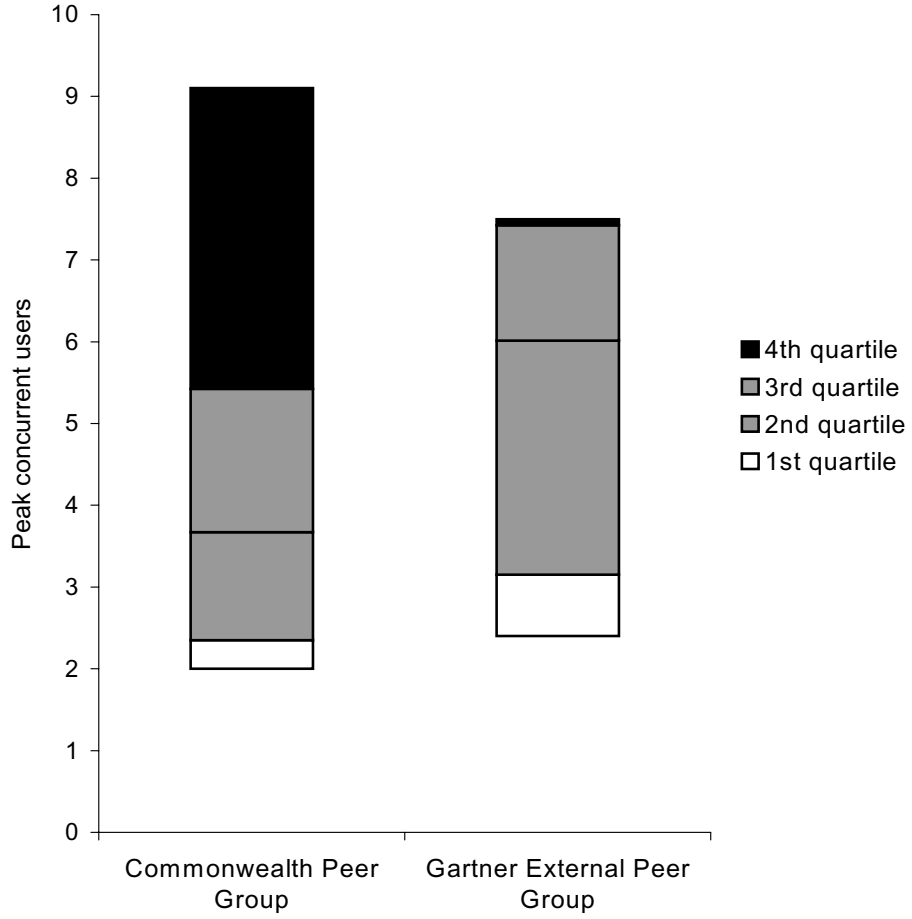
4.43 The relatively low level of senior management expenditure by the majority of Commonwealth peer group agencies may have contributed to the problems (as observed in the related FCA Audit) experienced by some agencies when trying to achieve a stable system. The audit found that some agencies did not have sufficient senior management involvement to ensure problems were dealt with on a timely basis.

Size of FMIS production team

4.44 The analysis in the Cost of Resources section (which commences on page 78) above suggests that the major difference in the composition of annual FMIS production costs related to the degree of reliance on internal versus external staff. While the level of reliance on external resources had proportionally decreased from implementation to production, the agencies from the Commonwealth peer group still had a relatively higher level of reliance on external resources compared with the Gartner external peer group. This reliance on external resources for FMIS production is likely to be related to the high level of reliance that was established during the implementation stage.

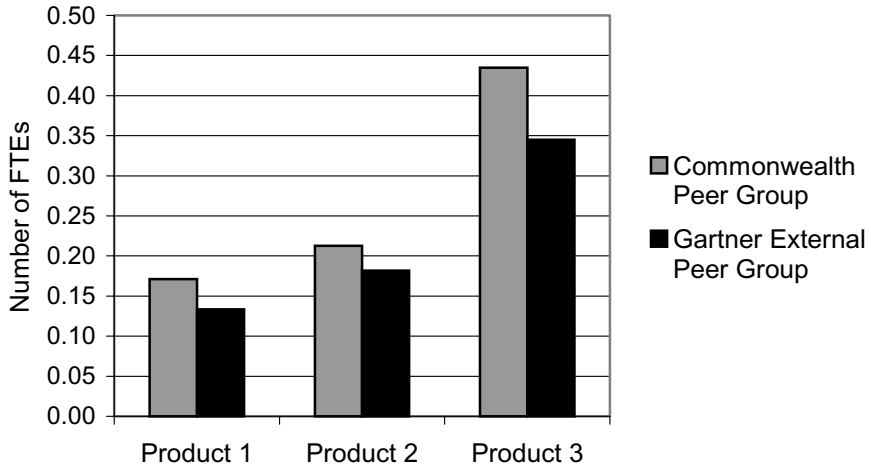
4.45 The Commonwealth peer group had an average of four users per FTE compared to the Gartner external peer group result of five users per FTE. Consistent with the results for implementation, the Commonwealth peer group generally provided a higher level of support for users during FMIS production. Analysis of this in conjunction with the results for cost per FTE (Figures 4.7 through 4.10), indicates that the Commonwealth peer group had relatively larger FMIS production teams with more expensive resources than the Gartner external peer group. In addition, the split of implementation costs between internal and external resources suggest the Commonwealth peer group had relatively fewer internal resources available for FMIS production, and relatively more external resources to administer their selected products.

Figure 4.12
Number of peak concurrent users per FTE (FMIS production)



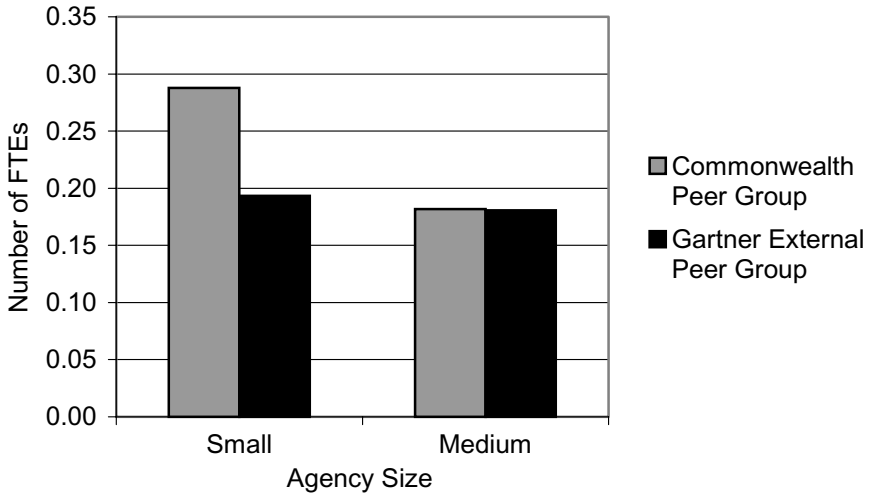
4.46 Figure 4.12 indicates that the Commonwealth peer group generally applied more resources to FMIS production than the Gartner external peer group. However, one agency in the Commonwealth peer group applied fewer resources per user to FMIS production than the Gartner external peer group.

Figure 4.13
Average number of FTEs per peak concurrent users by product (FMIS production)



4.47 Figure 4.13 indicates that agencies that implemented Product 1 provided a lower level of support per user relative to the other products. Agencies that implemented Product 3 (the mid-range accounting product) provided the highest level of support to users. The Commonwealth peer group provided a higher level of support to users (in FMIS production) for all products compared to the Gartner external peer group. In addition, production resources applied to Products 1 and 3 were generally less expensive than the Gartner external peer group. While Product 2 provided less support to concurrent users, the cost of its resources were significantly higher than the other products and the Gartner external peer group which contributed to a relatively high FMIS production cost per user.

Figure 4.14
Average number of FTE per peak concurrent users by agency size (FMIS production)



4.48 Figure 4.14 indicates that small-sized agencies provided a higher level of support per user relative to medium-sized agencies. In addition, the Commonwealth peer group provided a higher level of support than the Gartner external peer group for all small-sized agencies.

4.49 The related FCA Audit found that most agencies had user satisfaction problems and experienced delays in achieving required functionality after the 'go-live' date. It is likely that the relatively lower level of support offered by some agencies in the Commonwealth peer group contributed to these problems.

Conclusion

4.50 Overall, the cost per peak concurrent user for the Commonwealth peer group (including the cost of application servers) for FMIS production was slightly higher than for the Gartner external peer group result. However, based on an analysis of agency size and product type, agencies from the Commonwealth peer group that were medium-sized and/or had implemented Product 1, on average, had a higher FMIS production cost relative to that of their Gartner external peer group. In addition, the agencies from the Commonwealth peer group, on average, had significantly higher production costs.

4.51 The related FCA Audit found that, in general, the larger products proved more costly to maintain as they were more complex and required more highly skilled resources to be involved in the production process.

4.52 Reasons identified for the variation in the cost of FMIS production were numerous, including:

- some agencies had better cost monitoring and allocation systems;
- most agencies were undertaking remedial or re-implementation activities after the 'go-live' date. If these activities were extensive it would significantly increase FMIS production costs. In most cases, agencies were reliant on external resources to undertake the remedial or implementation activities; and/or
- some agencies had relatively expensive application server costs.

4.53 In general, agencies within the Commonwealth peer group had greater variation in the cost of internal resources, external resources and FTEs for FMIS production relative to their Gartner external peer group.

4.54 In addition to having more expensive FMIS production resources, the agencies from the Commonwealth peer group also had relatively larger FMIS production teams. In particular, small-sized agencies and/or agencies that implemented Product 3 (the mid-range accounting product) from the Commonwealth peer group had the largest FMIS production teams.

4.55 The benchmarking study results reflect different practices between small and medium-sized agencies in recording their costs between FMIS implementation and production, for the purposes of this study. For example, small-sized agencies had higher costs during implementation but lower costs during production relative to medium-sized agencies. It is likely that these cost allocations between implementation and production represent different implementation approaches. Specifically, small-sized agencies sought to implement most required functionality by the 'go-live' date while, in comparison, medium-sized agencies sought to implement a base level of functionality by the 'go-live' date and then implement more functionality after the 'go-live' date.

4.56 A similar pattern of expenditure between implementation and production was not observed in relation to product types. In particular, large accounting and ERP products had higher costs for both implementation and production. In addition to the factors mentioned above, the higher FMIS production costs for these types of products were associated with agencies undertaking significant remedial and additional implementation activities to achieve required functionality after the 'go-live' date.

Canberra ACT
13 March 2002

P. J. Barrett
Auditor-General

Appendices

Appendix 1

About the study

Benchmarking studies

Benchmarking studies are undertaken under the general performance audit provisions of the Auditor-General Act 1997. The process of benchmarking aims to systematically measure an agency's performance against its internal and external peer groups. Benchmarking is a practical tool for continuous improvement as it establishes quantifiable measures for business processes and activities, and uses these to analyse performance trends over time. Through benchmarking, an agency may identify problem areas in its performance and target areas for the improvement of public sector administration. Benchmarking studies can be used by public sector managers in meeting their responsibilities and to inform the Parliament about aspects of public administration which are not likely to be covered by the financial statement and performance audit products. They examine common business support activities and processes, including:

- systems of internal control;
- the accountability framework; and
- legislative and procedural compliance.

Benchmarking studies have been focused on examining key issues affecting the public service in recent years, including financial management and reporting, and internal audit. This report is part of a series of proposed benchmarking studies being undertaken by the ANAO on Information Management, Information Systems and Information Technology topics. There is also a benchmarking study on Human Resource Management currently being undertaken which will be tabled during the 2001–2002 financial year.

Benchmarking study objectives

The ANAO, in conjunction with Gartner, undertook a benchmarking study within the Commonwealth Budget Sector to determine and report on FMIS:

- implementation and production costs; and
- implementation timeframes.

Performance information

Planning for this audit commenced in September 1999 with research into FMIS and HRMIS.

The ANAO provided a report on the results of the study to each agency reviewed as part of the study during March and April 2001.

The total cost of the study was $417 000, including professional fees paid to Gartner.

Appendix 2

Other IT production costs

Two other cost areas contribute, in part, to the implementation and production costs of the FMIS. They are the cost of distributed computing environment and the Wide Area Network (WAN). However, only a portion of each of these cost areas related to the implementation and production costs of the FMIS. Due to the difficulties associated with directly allocating costs to the FMIS implementation and production, the full cost of these activities are examined using the following metrics.

Table 1
Gartner key metrics

Metric types	Key metrics
General IT cost of resources	Distributed computing cost[32] per distributed computing users. Wide area network cost[33] per device.

At the time of the study, one of the Commonwealth peer group agencies had fully allocated the cost of distributed computing and WAN to its FMIS. As a result, this agency did not separately provide cost information for the purpose of analysing distributed computing or WAN production performance.

[32] The distributed computing cost includes the total of occupancy, external, personnel costs, LAN and shared services, software and hardware.
[33] The wide area network cost includes the total of hardware, software, transmission, personnel, external and occupancy.

Figure A
Cost per distributed computing user

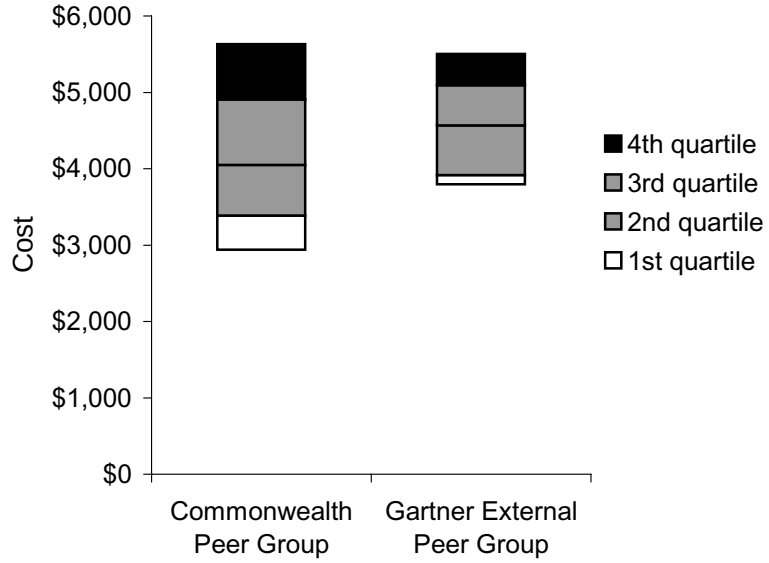


Figure A shows the range of spending on distributed computing for the Commonwealth and Gartner external peer groups. Three agencies from the Commonwealth peer group spent less than $3 500 per distributed computing user during production. In contrast, the Gartner external peer group spent more than $3 500 per distributed computing user. The lower costs recorded by some of the Commonwealth agencies could be attributed to a number of factors including Commonwealth agencies:

- having very cost-efficient provision of services;
- negotiating good contract prices with their IT providers;
- receiving a low service provision from IT providers;
- not requiring complex or sophisticated technology due to the nature of the computing environment; and/or
- not using sophisticated technology or updating their systems regularly.

The higher costs in the Commonwealth peer group generally reflected agencies that had purchased or leased relatively sophisticated technology and/or had more complex computing environments and requirements.

Figure B
Cost per device (WAN)

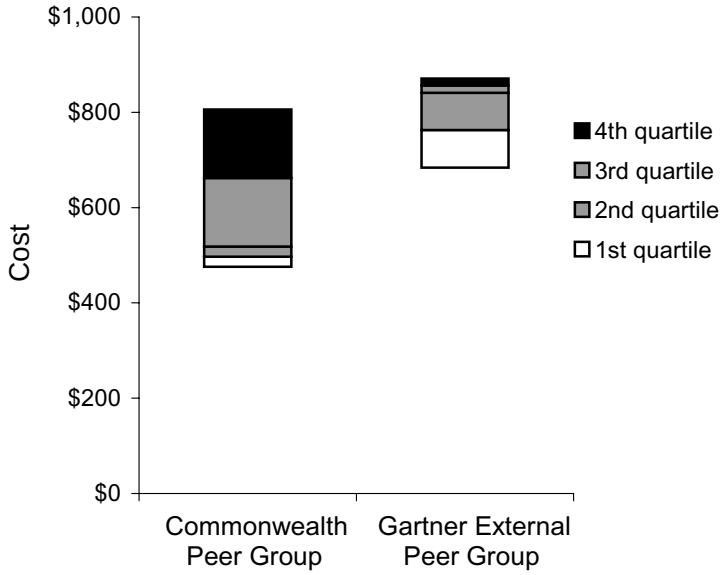


Figure B shows the range of spending on WAN per device for the Commonwealth and Gartner external peer groups. The Commonwealth peer group generally spent less per device during production than the Gartner external peer group. In addition, WAN cost per device for two agencies in the Commonwealth peer group fell below the Gartner external peer group range. These agencies should ensure that they have not under-resourced their WAN environments.

Glossary

Term	Definition
Benchmark study	The process of comparing a product, service or process with other samples from a peer group, with a view to identifying 'best practice' and targeting oneself to emulate it. For example, analysing the costs of implementing and maintaining an FMIS product.
Commonwealth peer group	The eight Commonwealth budget sector agencies examined as part of this benchmarking study.
Commonwealth Procurement Guidelines	Provides the framework by which Commonwealth agencies should undertake the purchasing process. Further information on Commonwealth Procurement can also be obtained at http://www.finance.gov.au/ctc.
Completed implementations	The point in time at which the implementation of an FMIS product has achieved most of the identified requirements and can be used for operational purposes.
Concurrent users	The number of users logged onto the system simultaneously.
Core attributes	System characteristics that contribute to the useability and veracity of the product. For example, efficient speed of response, multi-user access and user friendliness.
Cost-benefit analysis	A formal comparison of tangible and intangible costs and benefits associated with a specific project with the aim of ensuring that the identified benefits outweigh any costs.

Term	Definition
Cost-effective	A measure that contributes to an assessment of whether a value-for-money outcome has been achieved for a procurement exercise. In particular, it establishes that the objective of the exercise has been achieved cost-efficiently.
Cost-efficient	A measure that establishes whether the costs of an activity, service or project has been contained within a reasonable range. However, the measure does not consider whether the objective of the activity, service or project was achieved. Cost-efficiency is one aspect of cost-effectiveness.
Dialog steps	Measure of the number of screen changes to process a transaction. For example, there may be four screen changes to register a purchase order. If an agency processed 12 purchase orders in a month the dialog steps for the month would equal 48.
Distributed computing users	The number of computer users geographically dispersed across all agency sites.
Enterprise Resource Planning (ERP) Products	ERP products were initially designed for large complex, multinational businesses such as manufacturing and sales and distribution organisations. These products were widely adopted for standardising, automating and integrating a company's financial and other back-end processes. Other back-end processes that have been included in ERP product functionality include HR, manufacturing, sales and distribution, material management, project planning and quality management. The major advantages of these products are that they offer: • superior functionality, particularly integration of business applications; • leading-edge technology; and, most importantly, • scalability.

Term	Definition
Evaluation methodology	Allows the agency to weight requirements according to priority and recognise value-for-money considerations in relation to business requirements.
Financial Control and Administration Audit (FCA)	Audits undertaken under the general performance audit provisions of the Auditor-General Act 1997. They are concerned with improving the quality of public sector administration through assessing and making recommendations on refining common business support activities including systems of internal controls, the accountability framework and strategies for risk management.
FMIS implementation	The process of implementing an FMIS product. It follows product selection and encompasses design, modification, installation and testing. The objective of an FMIS implementation is the delivery of an operational FMIS.
FMIS production	The period immediately following the implementation of an FMIS product when the system is used for processing the operational requirements of the organisation. It encompasses aspects of resourcing, maintenance and management. For the purposes of this study, FMIS production costs are presented as an annualised figure.

Term	Definition
Functionality	The capabilities offered by a product being used to assist in the attainment of identified business needs for an activity, function or area. For example, the FMIS is an integrated software application that is used to provide a range of financial processing, recording and reporting functionality for agencies. Typically an FMIS would support general ledger, accounts payable and accounts receivable functions of an organisation. In addition, the FMIS can provide a range of more advanced functionality including inventory, cash and asset management, as well as financial and management reporting services for agencies.
Future concurrent users	The planned number of concurrent users of the FMIS when it is fully operational. This measure should be established during product selection and it may be revised during implementation.
Gartner external peer group(s)	The organisations selected from Gartner's databases of public and private sector organisations that are considered comparable, with respect to size and complexity of the IT functional area, to each agency within the Commonwealth peer group. Each agency in the Commonwealth peer group has a different Gartner external peer group, and each agency may also have a different Gartner external peer group for each IT functional area.

Implementation Full-Time Equivalents (FTEs)	A measurement that calculates the total logical number of FMIS implementation staff. It is calculated by counting the number of days (including all leave and administration time) taken by implementation staff to complete an implementation activity. For example, if the labour tracking system shows that the implementation team have contributed 220 days to the project, then that (logically) represents one FTE. This measurement is based on Gartner's definition of FTE.
Implementation outcome	The extent to which agency objectives, core attributes, functionality and cost-effectiveness are delivered by the FMIS in production.
Integrated systems	Refers to the seamless interaction across various application systems due to commonality in data structures and shared data files.
Interfaced	Refers to the generation of standard templates for the transfer and upload of information from one application system to another where different data structures and data files exist.
IT functional area	Gartner has a database for each different functional area contained within an IT environment. For example, IT functional areas include distributed computing, Wide Area Network and FMIS implementation. The definition of each functional area is contained within a Consensus Model developed by Gartner.

Term	Definition
Peak concurrent users	The highest number of concurrent users reported during a month of FMIS production.
Production FTEs	A measurement that calculates the total logical number of FMIS production staff. It is calculated by counting the number of days (including all leave and administration time) taken by FMIS production staff to complete a maintenance activity. For example, if the labour tracking system shows that the FMIS production team have contributed 220 days to maintenance, then that (logically) represents one FTE. This measurement is based on Gartner's definition of an FTE.
Related FCA Audit	The term used to refer to the ANAO Audit Report No.12 of 2001-2002 entitled *Selection, Implementation and Management of Financial Management Information Systems in Commonwealth Agencies.* This report discussed findings in relation to the same eight agencies included in this benchmark study.
Relatively stable system	A system that has achieved a satisfactory level of functionality, availability and user acceptance.
Robustness	The agency's systems ability to integrate large volumes of data from diverse sources.
Scalability	The ability to add processing or user capacity to an application.

Term	Definition
Value-for-money	The core principle governing Commonwealth procurement. It aims to ensure that officials buying goods and services are satisfied that the best possible outcome has been achieved taking into account all relevant costs and benefits over the whole of the procurement life cycle. It is underpinned by the principles of efficiency and effectiveness (of expenditure and processes), accountability and transparency, and ethics and industry development.[34]
Whole-of-life costs	Cost of an IT system covering the period from selection through to the end of its useful life. This typically spans a three to five-year period.

[34] *Commonwealth Procurement Guidelines and Best Practice Guidance,* September 2001, Department of Finance and Administration, p. 5.

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