Sydney Opera House – FM Exemplar Project

Report Number: 2005-001-C-8

Benchmarking Research Report

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PREFACE

The Cooperative Research Centre for Construction Innovation (CRC CI) is a national research, development and implementation centre focused on the needs of the property, design, construction and facility management sectors. Established in 2001 and headquartered at Queensland University of Technology as an unincorporated joint venture under the Australian Government's Cooperative Research Program, the CRC CI is developing key technologies, tools and management systems to improve the effectiveness of the construction industry. The CRC CI is a seven year project funded by a Commonwealth grant and industry, research and other government support. More than 150 researchers and an alliance of 19 leading partner organisations are involved in and support the activities of the CRC CI.

There are three research areas:

- Program A - *Business and Industry Development*
- Program B - *Sustainable Built Assets*
- Program C - *Delivery and Management of Built Assets*

Underpinning these research programs is an *Information Communication Technology* (ICT) Platform.

Each project involves at least two industry partners and two research partners to ensure collaboration and industry focus is optimised throughout the research and implementation phases. The complementary blend of industry partners ensures a real-life environment whereby research can be easily tested and results quickly disseminated.

This research report (Report 2005-001-C-8) is part of a series of reports for the Sydney Opera House – FM Exemplar Project and provides an update on the Framework for FM Benchmarking.

EXECUTIVE SUMMARY

Objectives

This benchmarking research report builds on the previous benchmarking review (Report 2005-001-C-1) and presents the benchmarking data collection and framework developments thus far. The objective is to deliver a benchmarking framework and recommendations on implementation of best practice on asset maintenance. The FM Exemplar Project using the Sydney Opera House has conducted a two (2) stage survey of iconic facilities.

The benchmarking team has been led by Rider Hunt Terotech with researchers from the CSIRO and The University of Sydney.

Findings

- A key finding is that benchmarking is a crucial decision making tool for organisations and processes, however the application FM benchmarking is not widespread or consistent.

- The research team have established a benchmarking framework has been including benchmarking methods, process, data collection and comparative analysis.

- The benchmarking survey instrument has focused on gathering the following:

    - Basic facilities statistics,
    - Status of benchmarking data and exercises,
    - Identification of KPIs for building condition assessment, energy, accessibility and contractors' performance,
    - Prioritisation of key drivers of facility status and functions,
    - Alignment of FM strategies with the organisational objectives, and
    - Methods of the evaluation of maintenance performance in key areas.

- Initial analysis of the benchmarking data from Survey Stage 1 initial responses (15 No.) has identified that the highest order items which should be considered core to an FM benchmarking framework would include;

FM Focus Area	Ranked KPIs
A. Condition Assessment	1. Building structure and services 2. Public spaces 3. Internal fittings and internal finishes
B. Energy Management	1. Rate of consumption 2. Management systems
C. Accessibility	1. Access for people with disabilities 2. Security provisions
D. Contractors' Performance	1. Safety compliance 2. Quality of service 3. Timeliness of service

- Survey Stage 1 responses have also identified the high level Status Drivers (by ranking) as;

    1. Functionality
    2. Landmark status
    3. Operational efficiency
    4. Cultural heritage

- KPIs and measurement metrics should be tempered by the corporate objectives and culture. For iconic facilities, and specifically performing arts centres, this may require reference to the mission of vision or such issues as the "six areas of key performance for arts centres; Recognition for excellence, Value for money, Pride in a key symbol, 'the experience', Artistic and industry development, and Access and equity" (Radbourne 1998)

- Survey Stage 2 has now been sent to Stage 1 respondents to elicit more detailed information, particularly regarding condition assessment and energy management.

Further Research

- Further input from the surveys will be required to increase the robustness of the results if the project output is to achieve intended FM benchmarking framework with broader industry applications.

- It is likely further investigation will be required beyond the FM Exemplar Project to implement and maintain the FM benchmarking framework.

1. Objectives and Scope

1.1 Introduction

The Facilities Management Exemplar project utilises Sydney Opera House (SOH) to develop research on facility management (FM) with the focus on strategic asset maintenance.

The project was initiated by the Facilities Management Action Agenda, supported by the Australian Government's Department of Industry, Tourism and Resources, Sydney Opera House and Transfield Services and is being delivered by the Cooperative Research Centre for Construction Innovation (CRC-CI), CSIRO, FMA Australia and industry and educational partners. The project's three research themes cover the following:

- *The digital modelling research* aims to develop a digital FM model based on the 3D digital building models to assist in the integration and automation of facility management.

- *The procurement research* aims to develop a performance-based procurement framework for service delivery. FM requirements are defined in terms of performance objectives and the use of multi-criteria decision making strategies.

- *The benchmarking research* aims to develop a performance benchmarking system that comprises performance measures, methods and procedures, and deliver benchmarks which enables facilities to identify and improve critical success factors.

Digitisation, procurement and benchmarking are crucial in improving the performance of FM. The procurement develops strategic plan and deployment framework enabling products, services, etc. meet objectives of performance, economic, environment, etc. The project aims to achieve innovative strategies across these areas and seeks to develop collaboration between them as a basis for demonstrating FM as a business enabler.

The benchmarking team has been led by Rider Hunt Terotech with researchers from the CSIRO and The University of Sydney. This benchmarking research report builds on the previous benchmarking review (Report 2005-001-C-1) and presents the benchmarking data collection and framework developments thus far.

1.2 Benchmarking Research

The following objectives on the benchmarking research will be achieved through the development of the project:

- Review benchmarking in facility management with the focus on the asset maintenance. Identify key issues and methodologies through the analysis of SOH case study and best practices.

- Develop an asset maintenance benchmarking system for both adoption by SOH and for the FM community in general. Develop a set of benchmarks for areas considered to contribute the most value to the improvement of maintenance performance.

- Deliver a benchmarking framework and recommendations on implementation of best practice on asset maintenance.

The previous benchmarking review (Report 2005-001-C-1) deals with the following topics:

- Review of Benchmarking in FM covering performance assessment and the balanced scorecard approach, the benchmarking process and systems.

- Analysis of Benchmarking Systems covering maintenance benchmarking, query generation, data structures and process management.

- Analysis of Information on Maintenance covering information of building, asset and service, and collection of information.

- Recommendations on an integrated information model.

1.3 Deliverables

This Benchmarking Research Report builds on the previous work and presents the benchmarking framework developments and data collection thus far.

2. Benchmarking and Decision Making

A literature review of existing benchmarking data found very little in the way of FM benchmarking data. The Facility Management Association of Australia (FMA Australia) published an Operating Cost Benchmarks (1999) and the International Facility Management Association (IFMA) prepare a number of Research Reports (#18-1977, #21-2001 and #23-2002) dealing with FM benchmarking periodically. The Property Council of Australia (PCA) gather operating cost information for offices, shopping centres and annually publish their Benchmarks: Survey of Operating Costs. The Tertiary Education Facility Management Association (TEFMA) annually benchmark Australasian University campuses against 115 sectorial performance indicators.

Senior management of different organisations will use industry specific KPIs; i.e. hotels report in bednights; education institutions in EFTSs (equivalent full time student numbers); private companies in terms of profit etc. If FM is to be seen as a 'business enabler' then it must first align its KPIs with those units of measure most meaningful to the organisation's senior management to whom they report.

2.1 Types of Benchmarking

Benchmarking involves the organised collection of relevant Key Performance Indicators (KPIs). There are three types of benchmarking which can be used: internal, continuous improvement, and external. The 'typical' approaches to benchmarking are illustrated in the diagram below:

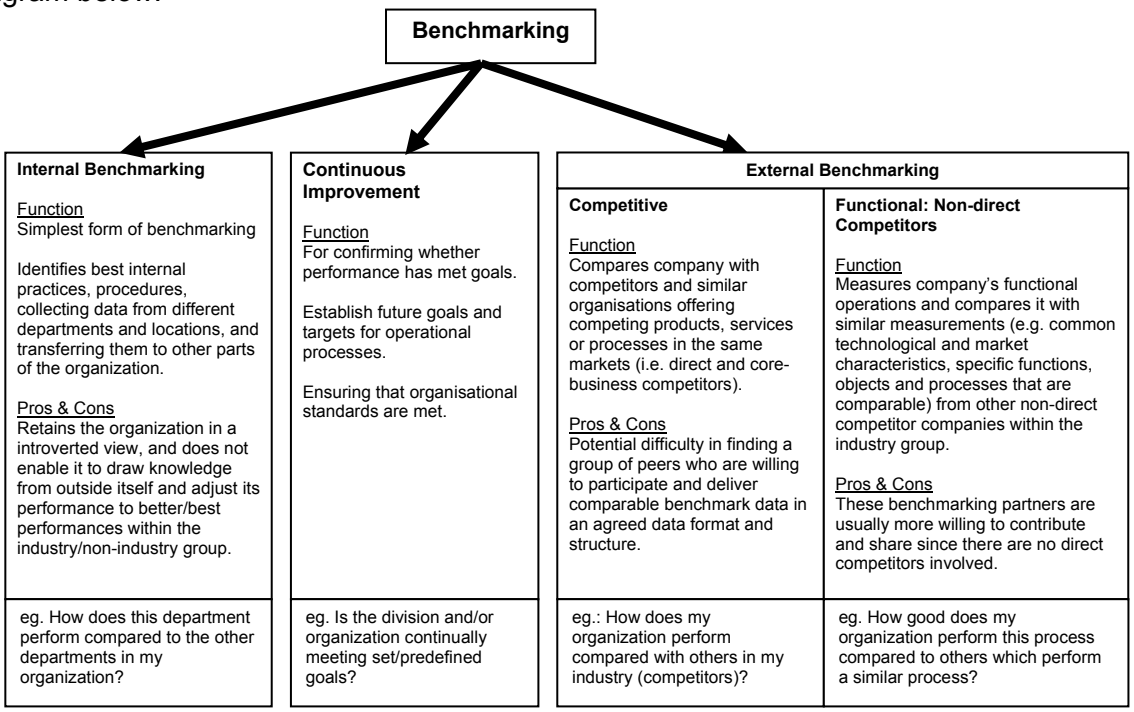


Figure 1 : Types of Benchmarking

2.1.1 Internal Benchmarking

At its most basic, internal benchmarking is used simply as a means of measuring activity. This requires an organisation's management to determine what management information is needed to monitor its activities and processes, and establish systems for collecting, storing and processing the data collected. This data may be used for supervising operations such as quality assurance, supervision of performance contracts etc. Frequent monitoring of KPIs can give managers timely warning of problems when sudden unexpected changes in values occur, i.e. management by exception. In a portfolio it allows notably good performance (and bad performance) to be identified. This allows Managers to undertake inquiries in order to learn the lessons of good performance and avoid the factors contributing to bad.

2.1.2 Continuous Improvement

The second type of benchmarking is an extension of the first in that managers attempt to better the performance of the previous KPI. Theoretically, these should ensure maximum efficiency at which point the KPI will stabilise at a minimum level whilst all stakeholders are satisfied. The problem with this approach is that the pursuit of resource minimisation or 'cost reduction' has a deleterious affect on quality and value.

The challenge under a continuous improvement regime for FM is to be identified as a 'value enhancer' rather than a 'cost to be cut'. This can be difficult for Facility Managers in organisations where FM is not core business if reliable benchmarks are not available.

2.1.3 External Benchmarking

The third type of benchmarking involves the collaboration of similar organisations in measuring KPIs of operations in common based on standard forms of measurement (eg. Property Council of Australia Standard Chart of Accounts for office buildings). This enables organisations to make direct comparisons between them, and determine which of those appear to be achieving 'best practice' (Radborne 1998).

However, external benchmarking concepts are useful only insofar as the similarity of the organisations making comparisons: If two organisations are working with different priorities and missions, or their portfolios are significantly unalike, then comparisons are invalid. Organisations should therefore first look for benchmarking data sets for organisations with whom they can identify.

2.2 The Benchmarking Framework

The benchmarking framework of this research study is built upon the Balanced Scorecard method first developed by Kaplan and Norton (1992). This framework enables the lower-level objectives to be aligned with the upper-level objectives and strategies of the organisation or facility. In FM terms, strategic level objectives should align with and support the upper-level organisational objectives and business strategies. The FM-level objectives are then further allocated to each of the four perspectives (as an 'exemplar', they have been categorised into four perspectives: financial, internal business processes, visitor and staff satisfaction, and innovation, growth and learning for this report).

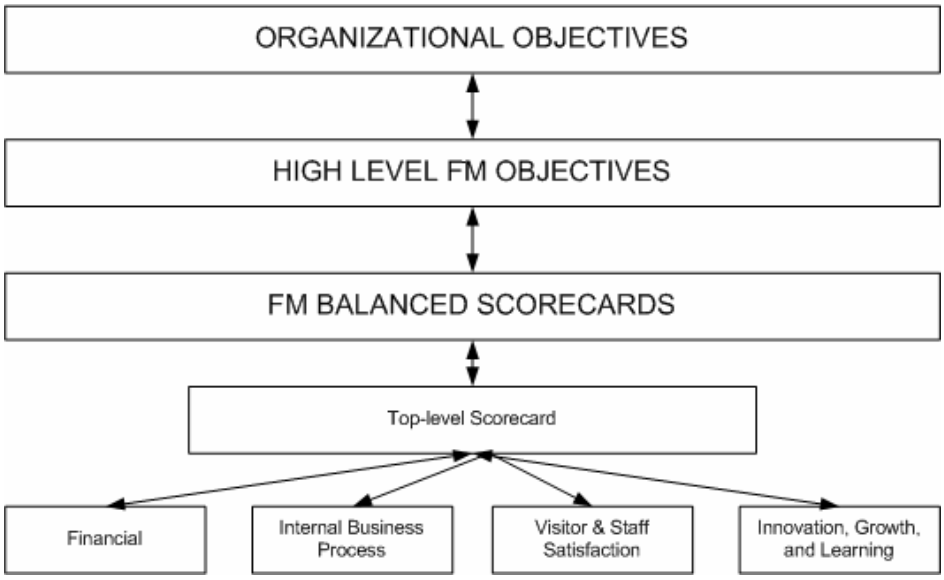


Figure 2: Linking higher and lower level objectives and KPIs (adapted and modified from Coronel & Evans (1999))

Benchmarking should express organisational strategy and achievement though a limited series of KPIs. These KPIs may be either attributes or values, and are selected to have the greatest relevance to corporate objectives; eg. a major KPI for most organisations is financial performance in terms of surplus or profit.

At the very top level a summary of KPIs requires the application of a balanced scorecard to determine overall success as expressed by the KPIs in which subjective factors might also be involved.

In addition, the alignment of upper-level and lower-level objectives and strategies may be taken further by applying the concept to identifying different decision-making levels (Figure 3 below). The different tiers of performance measures allow the identification of relevant measures for each level or tier within the organisations. Further not only does the required detail increase as you move from the upper-level and lower-level, but so too does the frequency of the monitoring or reporting cycles. For instance, upper-level (ie. executive or strategic) may view of facilities performance annually or quarterly for policy decisions, while lower-level (ie. service supervisor or operations) requires more detailed breakdown of the particular facilities performance (e.g. weekly, daily, hourly or sub-hourly metering, focused on activity and task level data).

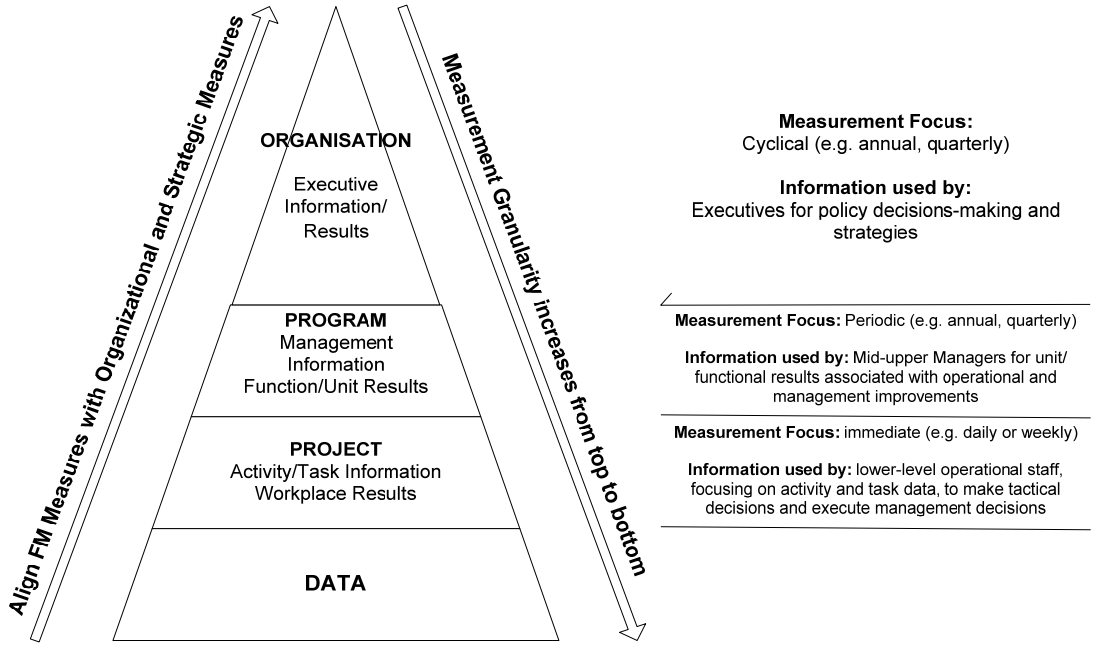


Figure 3 : Performance Measurement by tiers or levels

Organisational goals should cascade from the strategic through the functional to team goals and finally to individual performance goals. While cascading through the organisation makes the goals increasingly specific, they are still required to be entirely consistent in their support of organisational goals.

2.3 Types of Information

The following are generally considered as valid bases for performance measurement;

i. *Data Benchmarking*: A way of comparing quantitative measures (key figures) with competitors or with members of an industry group. In data benchmarking, the team is not interested in the underlying processes.

ii. *Process Benchmarking*: Undertaking a detailed examination of the processes which produce a particular outputs, through internal and comparative analysis of operations, work practices and business processes, with a view to understand the reasons for difference in performance levels, and drawing out best practice.

iii. *Product / Service Benchmarking*: Used to continuously measure an organisation's offerings against those of its peers or competitors. Comparison of outputs across different divisions or organisations, so that targets and priorities for gaining a competitive advantage can be established and industry best practices maintained.

iv. *Strategic Benchmarking*: Undertaken to compare organisational structures, management practices and business models.

v. *Benchmarking against a published or known standard*: Assessing against a level of performance or standard which defines best practice or a range of working practices and policies. It might be a published standard, guideline or known case study.

The second, third, fourth and fifth approaches focus on outputs and standards and are more concerned with the end result.

This research project aims to perform data and process benchmarking. For simplicity, data benchmarking will be performed first. Taking 'energy' for instance, measures are currently being developed to enable the collection of 'input' energy data from benchmarking partners (eg. electricity usage per performance space per audience). This will be followed by process benchmarking which differs in that it is concerned not only with what is achieved but also how it is achieved. It aims to identify gaps and opportunities in similar and dissimilar situations whereby 'processes' as well as 'outputs' may be compared and analysed. This form of benchmarking not only focuses on what others are performing well at by using suitable output measures, but also seeks to discover why they are top performers, eg. how they achieve quality and/or lower cost levels. Benchmarking should aim lead to improved understanding of processes that lead to superior output performances.

2.4 The Benchmarking Process

The benchmarking process seeks to understand what is already done and to obtain objective evidence or information about the level of performance a company should be pursuing with a final goal of developing an action plan to close the gap between the poor and strong performers. It has to be externally focused, measurement based, information intensive, objective and action gathering.

Organisations should step through the sequence of questions such as outlined by Tranfield et al (2004) for a framework for the strategic management of assets. It is at Tranfield's level of Asset Monitoring that considerations of benchmarking first arise, questions such as;

- *Are the assets fit for purpose?* Fitness for purpose presupposes that their performance can be measured such that when performance falls below an acceptable level remedial action is put into place. Any performance that is measured is a candidate for benchmarking.
- *What is the rate of asset deterioration?* This can be determined from the change in performance measurement.
- *What are the alternatives?* Alternatives are appraised by comparing measured performance against performance predicted for models of other potential solutions, assuming external sources of benchmarking data are available.

Any or all of internal benchmarking, continuous improvement, and external benchmarking might be appropriately invoked in reaching a conclusion to the above questions.

However, the intent of this research project is to produce guidance for organisations whose operations do not align with existing data sets, such as Sydney Opera House.

The key process steps in benchmarking identified in literature are not significantly different from each other. For instance, Finnigan (1996) lists the key process steps in benchmarking as establishing the study plan, conducting the study, analysis of data, internalizing results and closing gap with the competition, which includes integrating, action and implementing plans and monitoring progress, while APQC uses a four-phase model of plan, collect, analyse and adapt. On the other hand, Codling (1998) lists them as planning, analysis, action and implementation while Camp (1989) lists the key process steps as planning, analysis, integration, action and maturity.

For this project the benchmarking process steps have been summarised as follows:

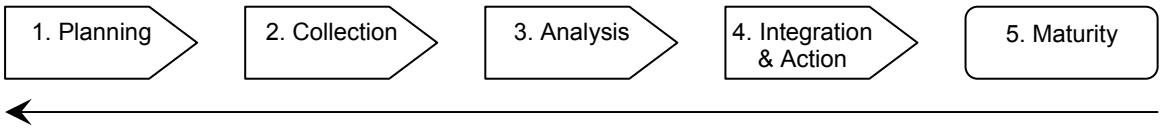


Figure 4 : Benchmarking Process

For this project the tasks undertaken by the above steps (and current status) can be reported as follows:

1. Planning (status: completed)

    - Project definition

      The project: FM Exemplar Project as initiated by the Facilities Management Action Agenda and supported by the Australian Government's Department of Industry, Tourism and Resources, Transfield Services, Construction Research Cooperative for Construction Innovation (CRC-CI), FMA Australia and industry and educational partners.

      The team: Led by Rider Hunt Terotech, and consisting of the CRC-CI and industry partners Sydney Opera House and Transfield Services, and researchers from the Construction CSIRO and The University of Sydney.

    - Scope of the study

      Case study subject: Sydney Opera House, Australia.

      Primary task?: To benchmark FM aspects of iconic and / or performing arts centre facilities (examples include; condition, energy, accessibility, contractors' performance and other indicators).

      Additional tasks?: Support digital modelling and procurement research themes, and collaboration of all three research themes to achieve an integrated FM solution with potential industry relevance.

      Identify potential benchmark partners; Over 80 potential iconic comparators have been identified including prominent performing arts centres and similar facilities, refer Appendix 7.3.

2. Collection (status: in progress)

    This phase has two distinct objectives: i) to gathering qualitative and / or quantitative data and ii) to learn how similar or different iconic facilities are in FM terms from the more common facility types.

A two stage survey instrument is being used to in Stage 1 register the interest of potential benchmarking partners and collect preliminary data. The Stage 2 survey has been sent to the Stage 1 respondents to gather more detail on specific KPI areas.

3. Analysis (status: in progress)

   Initial quantitative analysis has been conducted on Stage 1 survey returns (15 No. to date). Thereafter, more in-depth analysis (comparisons, gaps and opportunities) may be performed on the trends, practices and techniques used by benchmarking partners (eg. identifying barriers to or practices that achieve superior performance).

4. Integration and Action (status: future actions)

   - Identify gaps and opportunities
   - Develop process(s) to close the gaps and adapt techniques to fit the process, eg. applying a better / best FM practice to improve an organisation's performance.
   - Implement the change process and monitor the progress.
   - Recalibrating the benchmarks. Set up an ongoing reporting mechanism to enable benchmarking findings to be periodically updated, and the process refined.

5. Maturity (status: future actions)

   Once an organisation has incorporated best practices in all their business practices, it achieves maturity. It is most evident the search for best practice is reinforced in an organisation's culture of continuous improvement in all activities and support systems. Verification of this achievement is necessary.

3. Benchmarking Performing Arts Centres

Sydney Opera House is unique: it is a universally recognised facility of historical significance synonymous with Australia and thus an iconic building. As such it is often regarded as being in a class of its own with few facilities with which it can be directly compared. This is because the building itself has few repeated elements, due to its status there are very real constraints placed upon the asset maintenance procedures, and most strikingly the building services are confined to spaces where access is not as straightforward as in buildings with orthogonal geometries.

Radbourne has identified “six areas of key performance for arts centres:

- recognition for excellence
- value for money
- pride in a key symbol
- ‘the experience’
- artistic and industry development
- access and equity” (Radbourne 1998)

Whilst these six (6) beg for definition, they might be taken as representing the ‘missions’ of performing arts centres then it is suggested that FM practices are instrumental in the areas of ‘value for money’, and ‘the experience’, although these are implicit in the other four areas. Sydney Opera House clearly places high priority as an iconic building in ‘pride in a key symbol’ as the expectations of the Australian public are high. FM’s role in ‘artistic and industry development’ is tenuous.

Sydney Opera House management has to decide on the relative importance of each of these areas and this will determine the resources that will be allocated to each, and consequently effect the required management information – including the data to be collected to facilitate benchmarking.

Sydney Opera House currently has advanced systems for benchmarking cleaning, and the maintenance of the building fabric. This information is used for supervising performance contracts in these areas, and reporting performance.

Trend reports of these two KPIs show a general stability with minor fluctuation that suggests that if continuous improvement has been exercised, it has stabilised around a fairly steady state.

Sydney Opera House would certainly like to extend its current benchmarking to further areas of operation, specifically maintenance of building services systems, and to become involved in external benchmarking.

This research project is currently working to achieve benchmarking for internal, external and continuous improvement purposes. Sydney Opera House has developed and implemented a method of recording and assessing the presentation and condition of the physical fabrics of the facilities known as Building Presentation Index (BPI) and Building Fabric Index (BFI). BPI measures the ‘wear and tear’ of all elements of building: e.g. finishes, doors, handrails, glazing, landscaping etc. while BFI measures the ‘cleanliness’ and ‘tidiness’ of the building. The intention of this system is to enable the FM function to collect and store historical measures and find ways to continuously improve itself in the long run. Sydney Opera House’s current method for collecting data and scoring is illustrated in the following table.

BUIDING CONDITION INDEX (BCI) EVALUATION CHECKLIST					
Building Fabric Index (BFI)	Building Presentation Index (BPI)	BFI & BPI Rating	BFI Score Structure	(BPI) Score Structure	
			Wear & Tear	Cleanliness	Tidiness
Building Fabric Index (BFI)	Building Presentation Index (BPI)	100%	As new, no signs of Wear & Tear	As new	As new
Definition: A method of scoring the way the Bldg. is perceived Method: Through detailed inspection of Bldg. elements, room by room Elements: (all finishes, doors, handrails, glazing, landscape…ect.) By Whom: Maintenance Contractors and staff Inspection Frequency: - (Daily) for the Bldg elements. - (Two times a quarter) for functional spaces (Monthly) for the public areas	Definition: A method of scoring three separate items that have an effect on the way the Bldg. is perceived Method: Through the Bldg. tidiness and cleanliness *Overall Impression: a score given to the general appearance of the room on first entering it *Tidiness: scored on the staff management and presenting the work environment *Cleanliness: scored on the quality of cleaning provided by contractors By Whom: Cleaning contractors and staff Inspection Frequency: - (Twice daily) for the Bldg. - (Three times a week) for joint inspection with SOH (Weekly) inspection is assessed by reporting tool	90% - 99%	Very minor signs of wear & tear	Totally free of dust, dirt, litter, stains and odours	Only essential items visible and neatly presented, nil customisation, improvisation or personalisation (eg clean desk)
		80% - 89%	Minor signs of wear & tear	Minor signs of dust, dirt or stain - but not obvious. No litter or odours	Furnishings and fittings, customisation, improvising, personalisation, temporary signs and notices, works etc. Neatly presented
		70% - 79%	Some wear & tear, though still in working condition	Overall appearance affected by dust, dirt, litter, stains or odours	Furnishings disorganised. Customisation, improvising, personalisation, temporary signs and notices, works etc. Cluttered
		60% - 69%	Excessive wear & tear, though still in working order	Obvious signs of by dust, dirt, litter, stains or odours	Extremely cluttered, difficult to clean
		25% - 59%	Major damage affecting operation of Bldg. elements	Significant accumulation of dust, dirt, litter, stains or odours	Untidiness creates a potential safety hazard
		1% - 24%	Major damage health or safety	Hazardous accumulation of dust, dirt, litter, stains or odours	Untidiness creates an immediate safety hazard

Table 1: An illustration of Sydney Opera House current methods for collecting cleanliness data and scoring (BFI & BPI).

Sydney Opera House can be considered as a number of use categories: performance spaces; restaurants: retail etc. It is possible to derive benchmarking data sets for these functions, and hence derive functions to manipulate the data into meaningful and relevant KPIs for Sydney Opera House's use.

For example, if we could describe Sydney Opera House as comprising W% retail space, X% of performance space, Y% restaurant and bar space, and Z% circulation, with corresponding benchmarks of a, b, c and d $/m^2 annual operating costs respectively, we could arrive at an overall area weighted benchmark as:

$$\mathbf{(a.W + b.X + c.Y + d.Z)\ \$/m^2} \qquad \text{(Equation 1)}$$

[assuming that the total area **W + X + Y + Z** = 100%]

4. Benchmarking Framework Development

4.1 Benchmarking Systems

A benchmarking system allows a comparison of costs and techniques with those of similar businesses, bringing to light the better ways of doing things that exist, and the application of best practices that can help to improve organisational performance. To develop a quality benchmarking system, it is pertinent consider its key components espoused in the following section.

First, it is necessary to identify the sources of information, the use, and the quality of the data Camp, 1989). Whilst it is important to collect and compile information, it is crucial to ensure the reliability and homogeneity of measurements, and anonymity of the information contributed by each participating organisation. For purposes of this research, the sources of information will be the Sydney Opera House and other comparative facilities such as iconic buildings and in particular, performing arts centres. Subsequently, a comparative analysis will be made of the information derived from the facilities to preliminarily elicit relevant information, so as to help further define the investigation, make it more focused, and pinpoint information of highest priority (Camp, 1989).

Second, it is necessary to understand the primary function of a quality benchmarking system, which is: to help identify best practices and generate improvement opportunities for the participating organisations. Hence, the benchmarking system must be capable of identifying the position of the participating organisation in relation to its group of peers, ie. participating organisations. This is done by developing an appropriate assessment and classification framework that enables the generation of queries amongst participating organisations.

Third, in order to effectively perform benchmarking, it is crucial to understand the processes involved. For instance, in order for an organisation to raise the level of customer satisfaction that a customer derives from the consumption of a service, it is important that the processes involved are fully understood. It is then essential to map these processes (McCabe, 2001) by developing an assessment and classification framework for the data structure and a process management methodology for the benchmarking system.

4.2 Benchmarking Facilities Management

Clearly, the role of facilities management is to support the fundamental activities of an organisation in general or a facility in particular. Hence, the objective of the facilities management functions should be compatible with and reflect those of the organisation.

Benchmarking systems in facility management can be employed to monitor, control and improve or to simply to rank the organisation and its assets according to its performance targets. Benchmarking can be performed by an organisation internally; or as an external exercise between comparable partners; or to assess and evaluate the development of a performance indicator over time. Figure 5 illustrates a proposed benchmarking system to assist the SOH in achieving their strategic objectives with respect to asset maintenance.

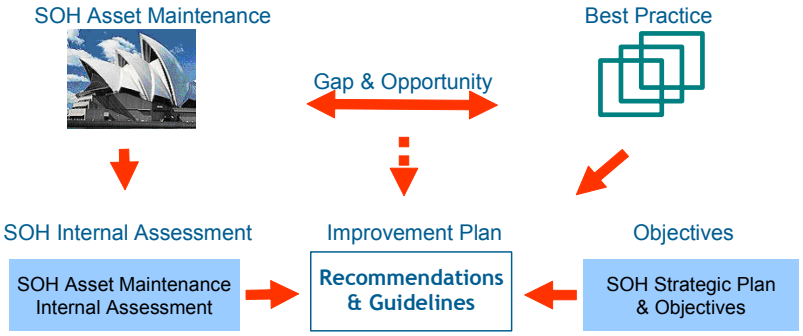


Figure 5 : A proposed benchmarking system to assist the SOH in achieving their strategic objectives.

A classification scheme for applications of benchmarking in facilities management has developed in this project, in order to be able to identify typical and especially successful benchmark types for specific objectives. The Building Fabric Index (BFI) as used by Sydney Opera House is shown in Figure 6 is an example. The BFI is used with the objective of 'monitoring and controlling', hence it is a quality benchmark, it looks at the trend of performance over time (historic), it is related to a specific function (functional) and it has no driver (none).

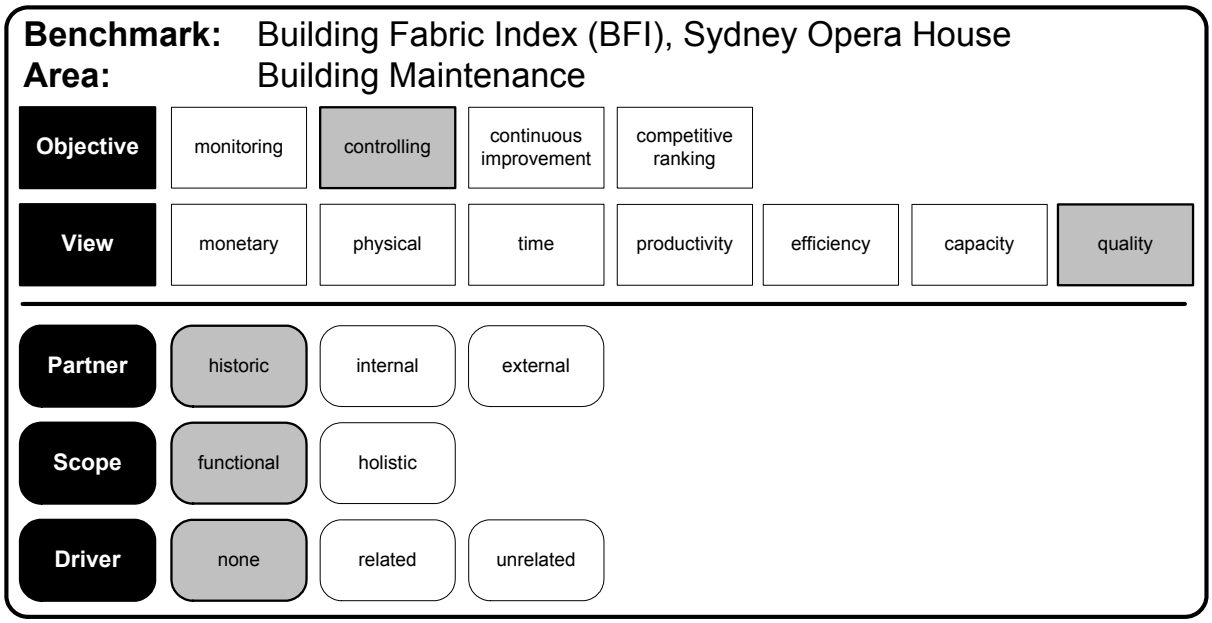


Figure 6 : A classification scheme for benchmarks using SOH's Building Fabric Index (BFI) as an example.

4.3 Benchmarking Sydney Opera House

The Sydney Opera House has the primary function of a 'Performing Arts Centre'. It is at the same time an 'Architectural Masterpiece', a 'Heritage Building' and further is of 'iconic' value for 20th century architecture and contributes to the tourism value of Sydney. These values bring objectives and requirements with them, which have to be integrated with or aligned to the objectives of the facilities management functions.

Based on the standard benchmarking process structure (Camp, 1989), a benchmarking process for SOH has been developed as follows:

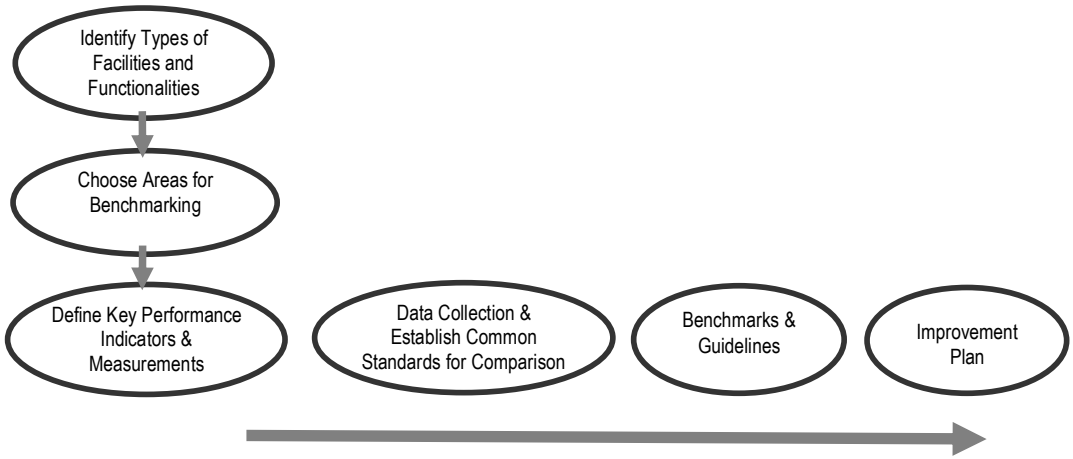


Figure 7 : Benchmarking process.

The benchmarking process can be summarised in the following steps:

- *Identifying types of facilities and functionalities* refers to finding a group of facilities with similar characteristics, core business or comparable functionalities for benchmarking.

- *Choosing areas for benchmarking* refers to the selection of features which are most valuable and relevant to the subject facilities for benchmarking.

- *Defining key performance indicators & measurements* describes performance objectives in terms of key performance indicators and establishes measurement methods and metrics.

- *Data collection and establishing common standards for comparison* refers to collecting data from a group of benchmarking partners and establishes common standards such as data structure and format for comparison.

- *Benchmarks and guidelines* identify benchmarks in the areas of interest and delivers recommendations and guidelines for SOH and the FM industry in general.

- *Improvement plan* can assist SOH and other facilities to improve the performance in the asset maintenance area in terms of the benchmarking targets.

The development of key performance indicators (KPIs) is presented following a systematic structured approach as it is illustrated as follows:

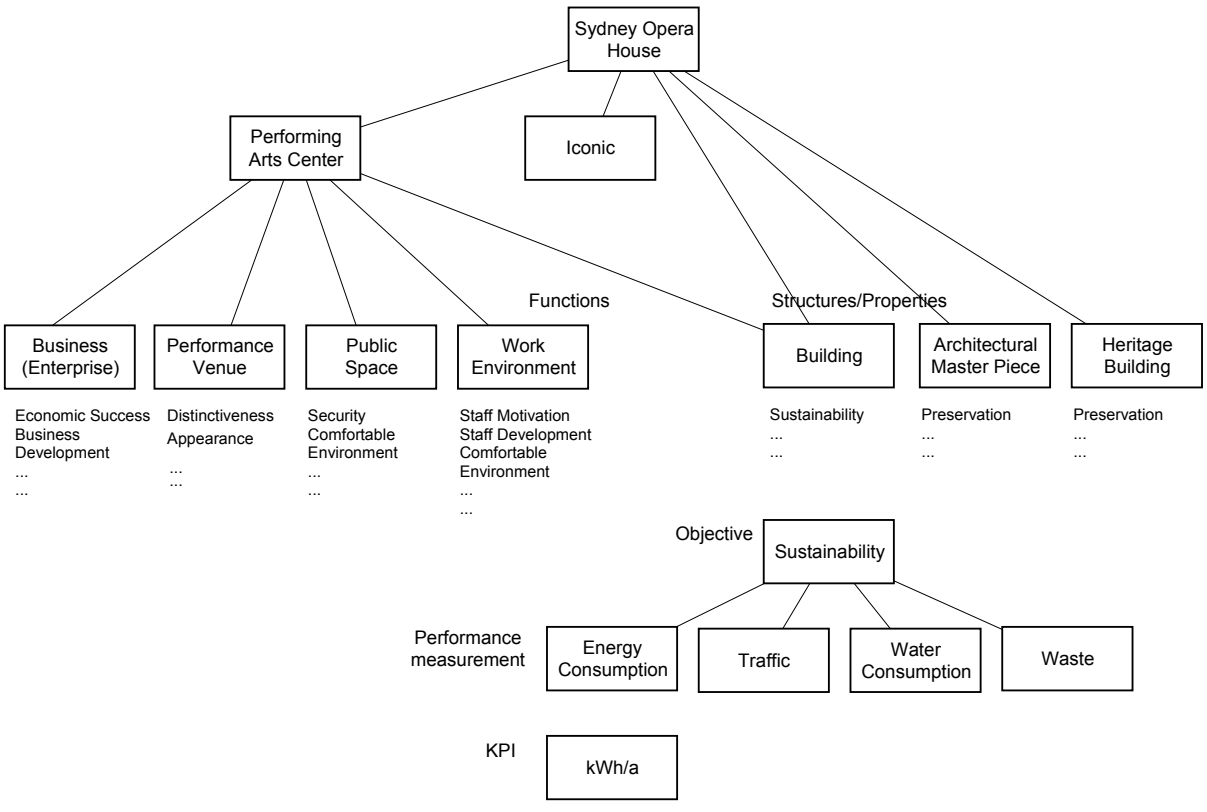


Figure 8 : Illustration of the KPI development.

Firstly the key organisational functions, and their corresponding function areas, their critical success factors and key performance indicators have been identified from available business documents such as reports and strategy plans. For instance, as a performing arts centre the Sydney Opera House functions as a business with the objective of attracting and holding sponsors and partners. Its critical success factors include being attractive to

sponsors and the branding of the Sydney Opera House name while some key performance indicators may include the number and value of supporting sponsors.

This is followed by the identification of the high-level objectives of facility management functions. According to the Sydney Opera House Trust Annual Report (2004), the key objective of facility management function is: “Providing first class venues, facilities and services that support our artistic and business aspirations.”

Secondly functions of facility management and its specific objectives are identified; for instance these include the building and custodial maintenance functions of facilities, are identified and their KPIs are derived.

Thirdly, these indicators are allocated to each of the perspectives. As an exemplar they have been categorist into four perspectives: financial; internal business processes; visitor and staff satisfaction; and innovation, growth and leaning.

The systematic objective development from high-level objectives to facilities management KPIs indicates which objective areas are relevant for the organisation and shall be employed to structure the benchmark system. Further it provides a hierarchical structured framework to identify the KPIs themselves.

5. Analysis of Benchmarking Surveys

5.1 Data Collection

Data collection is essential for asset maintenance, but not an end in itself (Wilson, 2005). It is crucial that the management develops a data collection strategy which could optimise the result of data collection effort in order to produce the best information that will enable to satisfy different management requirements (Shiem-Shin, 1996).

The research methodology developed for this project requires the identification of and participation by a range of iconic and / or performing arts centre facilities as benchmarking comparators. The data collection instrument developed was a two (2) stage survey sent via the post and / or email.

The primary objective of data collection phase was to identify a benchmarking group and facilitate exchange of information. This would it was believed establish the level of interest in pursuing FM benchmarking amongst iconic and / or performing arts centre facilities and in the identification of good practices in FM. An outcome of the process was to create a framework for benchmarking to highlight opportunities for improvement at SOH and for the FM industry in Australia. The participating organisations were / are invited to submit their organisations' performance data against key performance indicators (KPIs) for comparison to SOH and other facilities in the pool.

Initial contact with national and international organisations was looking for an expression of interest in being a benchmarking partner for the SOH project. It was also an attempt to verify the type and scope of data that they were currently collecting, and it's availability for the benchmarking study.

Both existing and potential data with benchmarking partners is being investigated. To assist benchmarking partners in developing better data collection, quality assurance of data, standardised vocabulary, and comparable collection methods will be recommended. It is suggested that the data collection be kept in a digital format for comparison and be able to integrate with the digital building models. Follow-up sessions will develop the scope, the data to be collected, and how it is to be analysed for benchmarking.

The result of the invitations to participate and the data collection and analysis represented the results are as at 19th May 2006. Currently this report focuses on the analysis of the Survey Stage 1 results. Future work will also try to describe how FM is carried out within benchmarking partners in comparison to the SOH, and will attempt to identify 'best practice' for iconic facilities.

The Benchmarking Survey Stage 1 (Appendix 7.1) has investigated the following:

1. Basic facilities statistics; ownership, age, size and FM delivery model.
2. The extent to which FM benchmarking data is currently collected.
3. The extent to which other benchmarking exercises are undertaken.
4. Identification of KPIs for aspects of facility performance for: condition assessment, energy, accessibility and contractor's performance.
5. Prioritisation of key drivers of facility status by: cultural heritage, landmark status, financial return, functionality, size by area or volume, operational efficiency and historic significance.
6. The alignment of FM objectives, strategies with the organisational objectives and strategies.
7. Whether the organisation is interested in participating in further international benchmarking research in FM.

The Benchmarking Survey Stage 2 (Appendix 7.2) is in progress, which will investigate:

1. Performance measurements and benchmarks in the following areas; condition, presentation and energy.
2. Methods of the evaluation in above areas and the regularity of evaluation
3. Other issues.

The project team has to date contacted 81 No facilities / organisations worldwide.

As at 19th May 2006, 15 No. facilities / organisations (including SOH) had returned completed the Survey Stage 1, and had moved on to Stage 2. Additionally there are 5 No. facilities / organisations that have confirmed that they are still completing the Survey Stage 1.

Following is the breakdown of the Survey Stage 1 participation:

Status	No's	Approx	
Completed Survey Stage 1 returned	15	18%	potential 31% positive response rate
Waiting for promised response	6	7%	
Acknowledgement of receipt	5	6%	
Declined opportunity	13	16%	
Reminder sent / follow up(s) made	42	53%	
Facilities invited to participate	81	100%	

Table 2: Benchmarking Survey Stage 1 current status

Our Benchmarking Survey Stage 2 will focus on capturing more detailed FM data particularly relating to facility condition and energy Management covering the following issues;

1. Criteria and terms currently used for condition assessments.
2. Criteria used to evaluate energy management.
3. Annual rate of energy consumption.
4. Process and benchmarking use for assessments.
5. Other facilities and non-facilities issues measured.

At the time of writing this report, 3 No. Survey Stage 2 responses had been received which was insufficient for analysis. Survey Stage 2 analysis will form part of the next Benchmarking Research Report.

5.2 Benchmarking Survey Stage 1 Analysis

5.2.1 General Information for the Facility

The first section of Survey Stage 1 sought general information such as name of the facility, current owner, age of facility (original/refurbished), floor area of entire facility (gross/net), floor area of performing arts spaces (gross/net), number of seats (performing arts spaces) base and expanded capacity, number of employees (excluding FM), number of employees (FM only), and whether FM services were outsourced and the extent, being fully or partially outsourced.

5.2.2 Benchmarking Facilities Management

The purpose of this section of the Survey Stage 1 was to seek an understanding as to whether the facilities are currently involved in FM benchmarking. Further, their involvement in any non-facilities management benchmarking exercises, and the types of benchmarking conducted was queried.

Only 46% of the facilities state that they are currently involved in benchmarking exercises in facilities management (Chart 1). Of the 46% conducting benchmarking, one third (15%)

stated that they conduct internal benchmarking only, while the remainder (31%) conduct both internal and external benchmarking (Chart 2). However, this information has to be treated with caution. It needs to be ascertained whether these facilities are performing true internal benchmarking or simply setting new targets for themselves based on an assessment of historical performance. This practice, through lack of credible mensuration could not be considered to be true benchmarking, but would more likely be considered as part of a continuous improvement program.

Performance criteria for continuous improvement may be very similar to KPIs for Benchmarking. It is possible they could be the same. Benchmarking is an activity that allows comparison between organisations, the service performance indicators must be able to establish a comparison to a recognised standard.

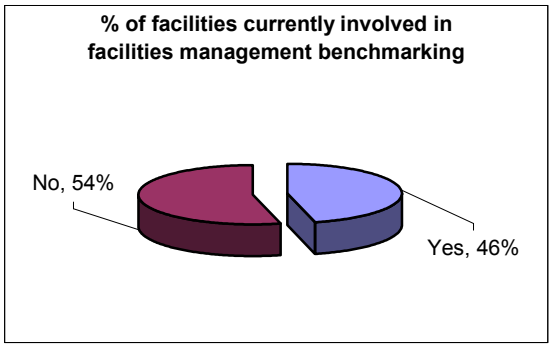


Chart 1: Facilities involved in FM benchmarking

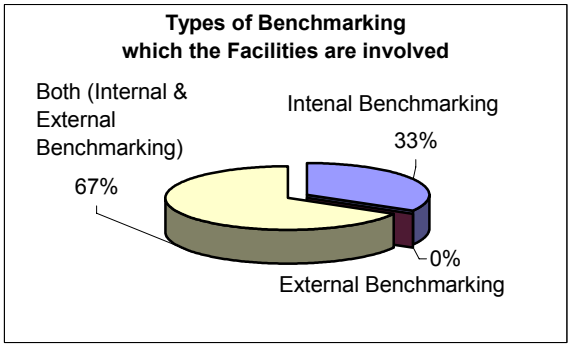


Chart 2: Types of benchmarking facilities involved in

The balance of the respondents, 54% of the facilities, stated that they are currently not involved in any form of FM benchmarking. SOH stated they were currently involved in FM benchmarking and undertaking both internal and eternal benchmarking.

However, 38% of the responding facilities stated that they are currently involved in benchmarking other 'areas/issues', apart from facilities management. Presumably this would indicate 62% of the organisations are not involved in non-FM benchmarking exercises.

The other areas / issues apart from FM which the facilities identified they were involved in are benchmarking of complaint management, value of real estate and activities with regards to performance and customer satisfaction.

While SOH appear to be currently involved in extensive benchmarking of all areas of the enterprise.

5.2.3 Facilities Management Performance Data and Metrics

This section of the Survey Stage 1 aimed to obtain an understanding of what most organisations regard as key indicators and/or determinants of the performance of their facilities. The groupings of indicators for facility performance proposed as being;

1. Condition assessments
2. Energy
3. Accessibility
4. Contractor's performance
5. Other indicators

Survey Stage 1 also sought to identify what other non-financial aspects the facilities measures, impacted on perceptions of performance. Further, respondents were asked to prioritise the status for the facility. The key status drivers, of which respondents were asked to rank the top five (5) in order of importance, were;

1. Cultural heritage
2. Landmark status
3. Financial return
4. Functionality
5. Size, by area or volume
6. Operational efficiency
7. Historic significance
8. Others

It was also important to understand whether such iconic / performing arts facilities do align their FM strategies and measures with their organisational objectives and strategies.

Lastly, respondents were asked if they were interested or not interested in participating in further international benchmarking research to formalise the project's benchmarking group.

With regards to which issues the facilities regard as key indicators of facility performance, the replies to date indicate the following by query heading.

5.2.3.1 Condition Assessment

Condition Assessment (Chart 3), set out a range of facility elements and spaces, of these the most highly regarded key indicator for facility performance was building structure (e.g. façade, roof, columns, beams) and building services (mechanical, electrical etc.) with 92%. These were followed by public spaces, internal fittings, internal finishes, office spaces, outdoor elements.

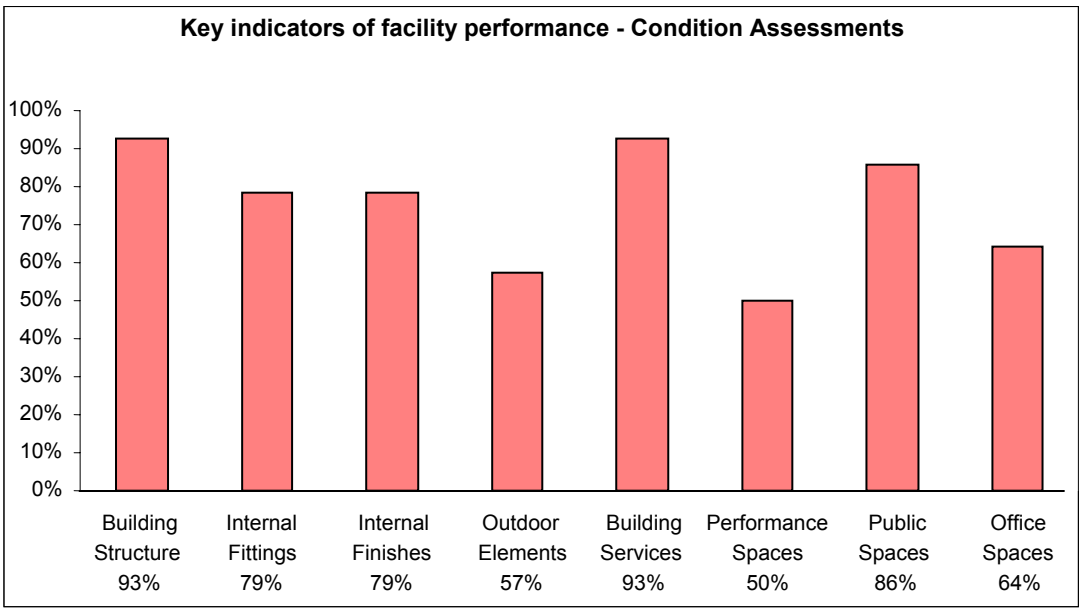


Chart 3: Key indicators of facility performance – Condition Assessment

Priority	Ranking by other Facilities	Sydney Opera House
1	Building structure and services (93% for each)	SOH regards all others (building structure, building facility, public spaces, internal fittings, internal finishes, office spaces, outdoor elements and performing spaces) except building services as key indicator for facilities performance.
2	Public spaces (86%)	
3	Internal fittings and internal finishes (79% for each)	
4	Office spaces (64%)	
5	Outdoor elements (57%)	
6	Performance spaces (50%)	

Table 3: Condition Assessment (comparing other facilities to SOH)

5.2.3.2 Energy

Energy (Chart 4) shows that rate of consumption with 77% ranks highest on the facilities' agenda, followed by management systems, supply quality and availability and generation transmission.

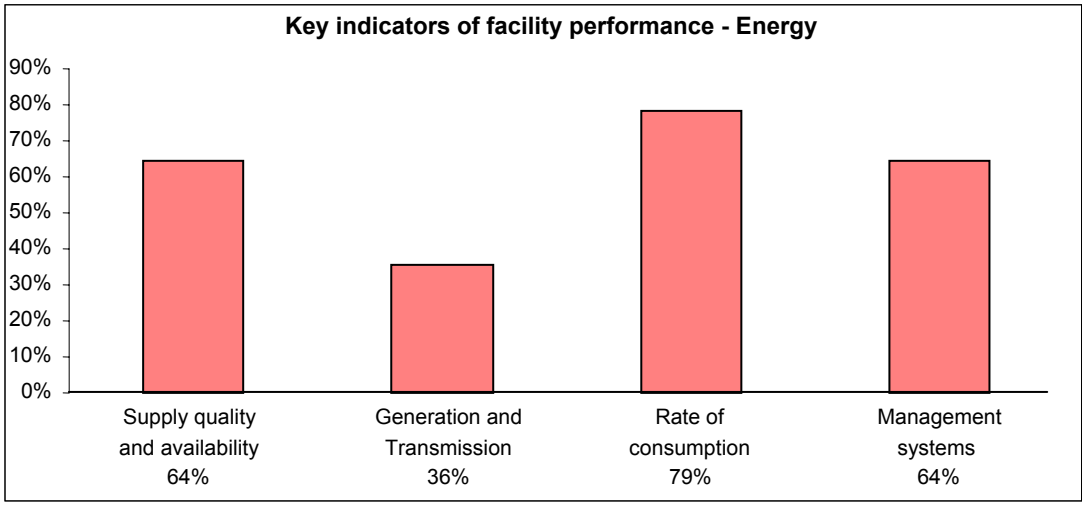


Chart 4: Key indicators of facility performance – Energy

Priority	Ranking by other Facilities	Sydney Opera House
1	Rate of consumption (79%)	SOH does not regard any of the energy issue as key indicator for facilities performance.
2	Management systems and Supply quality and availability (64% for each)	
3	Generation and transmission (36%)	

Table 4: Energy (comparing other facilities to SOH)

5.2.3.3 Accessibility

As for Accessibility (Chart 5), security provisions and access for disable people ranks the highest with 62% score, followed by vehicular parking, information to visitors and other issues.

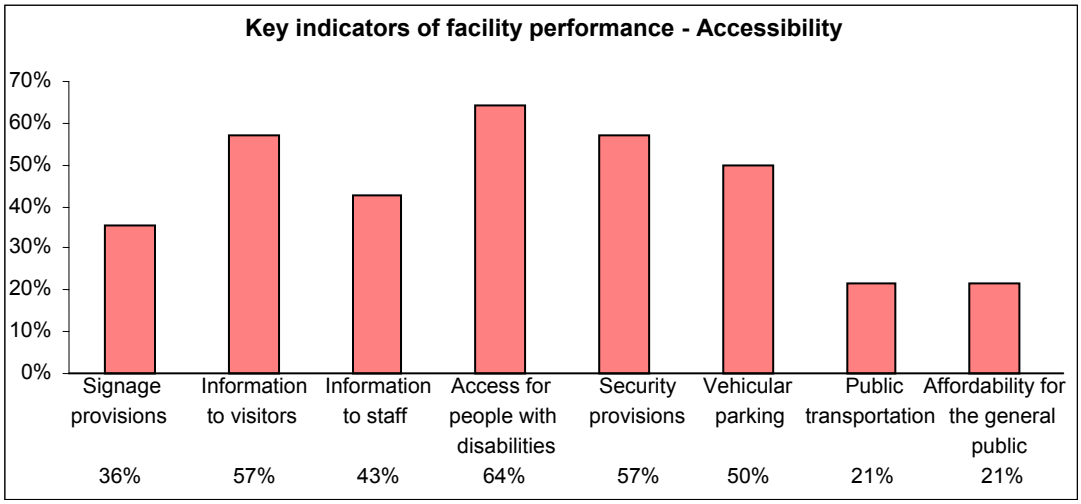


Chart 5: Key indicators of facility performance – Accessibility

Priority	Ranking by other Facilities	Sydney Opera House
1	Access for people with disabilities (64%)	SOH does not regard any of the accessibility issue as key indicator for facilities performance.
2	Information for visitors and Security provisions (57% for each)	
3	Vehicular parking (50%)	
4	Information to staff (43%)	
5	Signage provisions (36%)	
6	Public transportation links and Affordability for the general public (21% for each)	

Table 5: Accessibility (comparing other facilities to SOH)

5.2.3.4 Contractors' Performance

For Contractors' Performance (Chart 6), almost all issues come in at the same level of importance between 70-80% responses received except value for money and risk management.

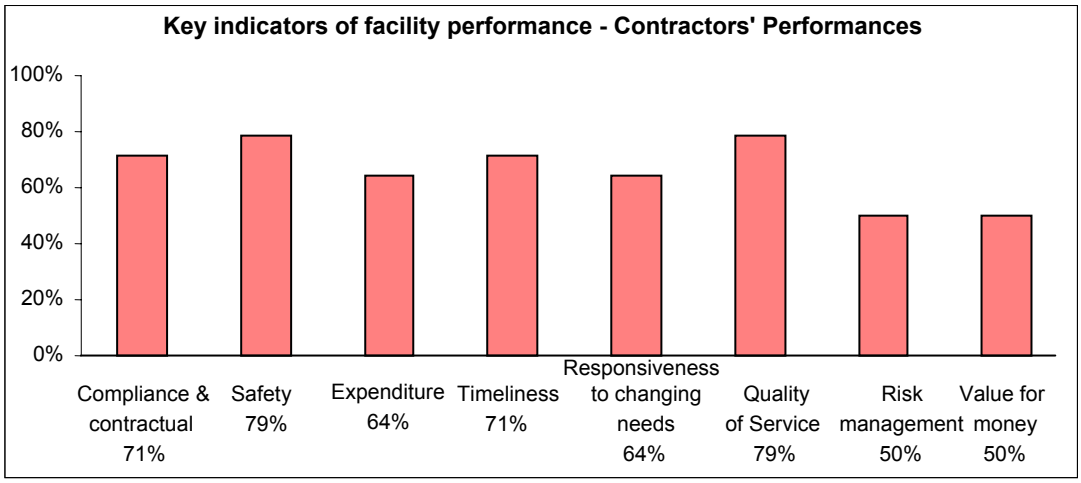


Chart 6: Key indicators of facility performance – Contractor's Performance

Priority	Ranking by other Facilities	Sydney Opera House
1	Safety and Quality of service (79% for each)	SOH regards all other (safety, quality of service, compliance & contractual terms & conditions, expenditure, timeliness, responsive to changing needs and value of money) except risk management as key indicator for facilities performance.
2	Timeliness and Compliance and contractual terms and conditions (71% for each)	
3	Expenditure, and Responsive to changing needs (64% for each)	
4	Risk management and Value for money (50% for each)	

Table 6: Contractor's Performance (comparing other facilities to SOH)

5.2.4 Status Drivers

Regarding the key drivers for the status of facilities, 92% of the facilities chose functionality as a key driver; followed by landmark status and operational efficiency (77% of the facilities have chose as a key driver for the status of facilities).

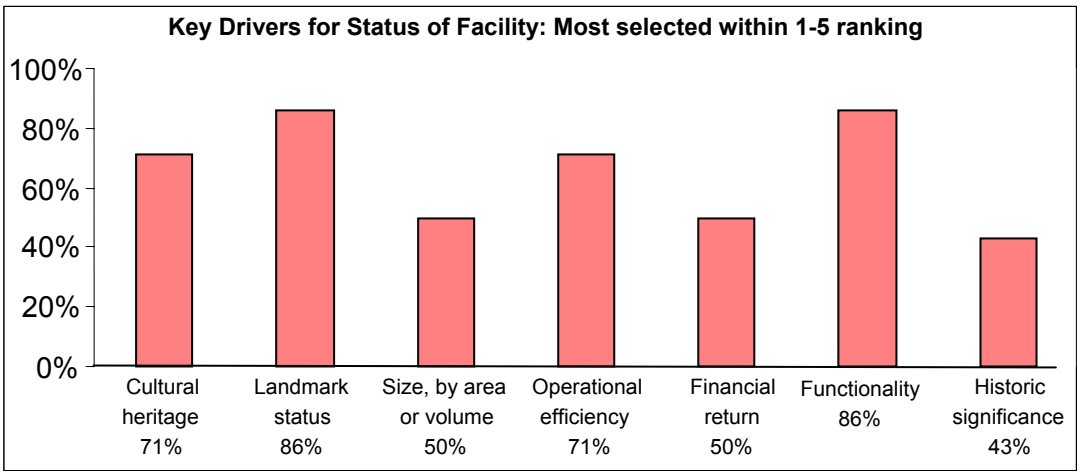
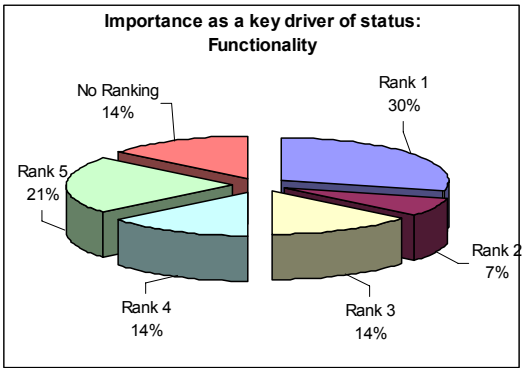


Chart 7: Key drivers for the status of facility

Priority	Ranking by other Facilities	Sydney Opera House
1	Functionality (86%)	SOH regards cultural heritage, functionality, size by area or volume, operational efficiency and diversity of performance and audience as key drivers for the status of facilities.
2	Landmark status (86%)	
3	Operational efficiency (71%)	
4	Cultural heritage (71%)	
5	Financial return (50%)	
6	Size, by area of volume (50%)	
7	Historic significance (43%)	

Table 7: Key drivers for the status of facilities

The following Charts 8 – 14 show the relative importance of key drivers of facility status for different parameters as rated by respondents. The results as seen from Charts 8 – 14 are somewhat different from the results in Chart 7.



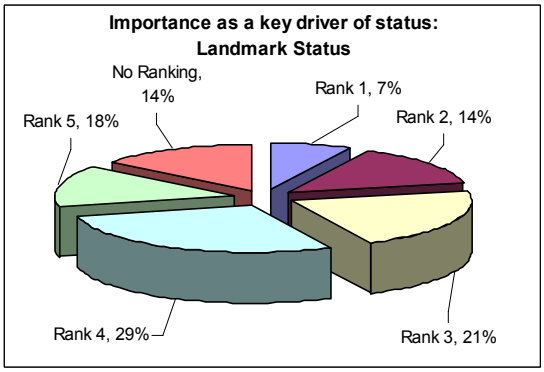


Chart 7.1 Functionality

Chart 7.2 Landmark status

Chart 7.1 shows that most organisations still place 'functionality' (Rank 1 - 30%) at the top of the key priorities / drivers for the status of their facilities at the same time SOH ranks 'functionality' third. Chart 7.1 is consistent with the findings of in Chart 7 in that 'functionality' is one of the key drivers for the status of their facilities. Chart 7.2 'Landmark status' in overall terms has achieved an equal ranking with 'functionality' but is listed here second in priority due to a more even distribution of the individual rankings assigned (ie. Rank 1 – 7%). SOH gave its highest ranking to 'Cultural heritage'.

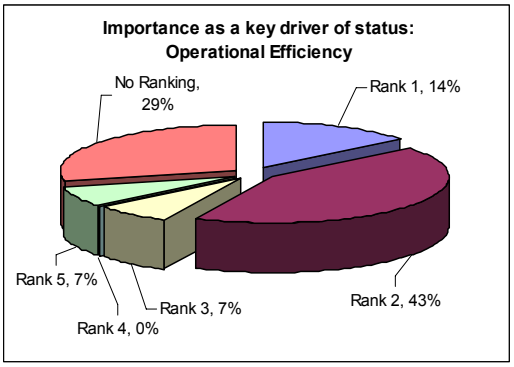


Chart 7.3 Operational efficiency

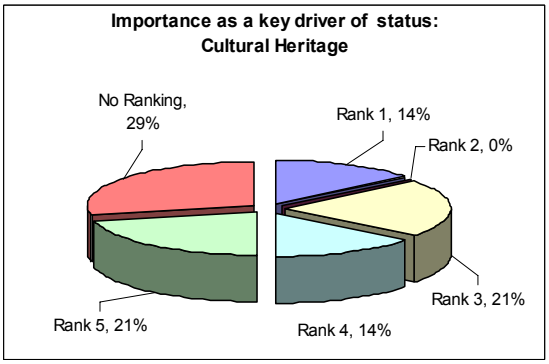


Chart 7.4 Cultural heritage

Chart 7.3 'Operational efficiency' and Chart 7.4 'Cultural heritage' follow in the hierarchy of overall ranking by other facilities as drivers of status with the key differentiator between their relative importance being the heavy weighting on operational efficiency in Rank 2 at 43%.

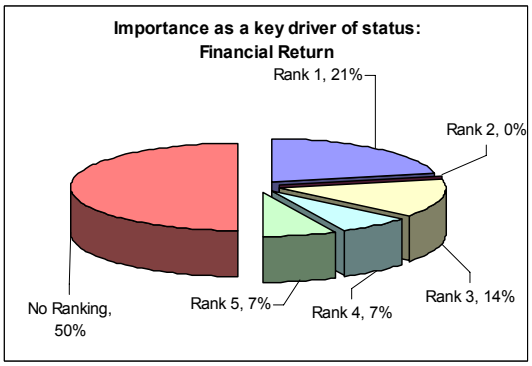


Chart 7.5 Financial return

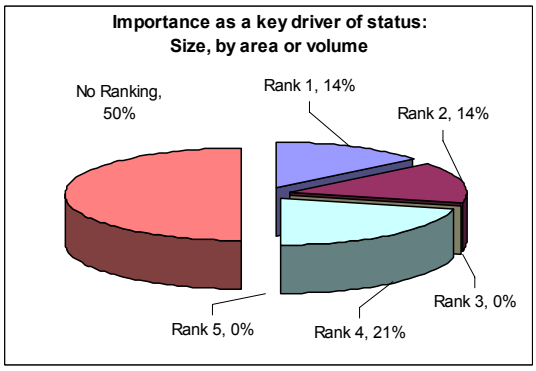


Chart 7.6 Size, by area or volume

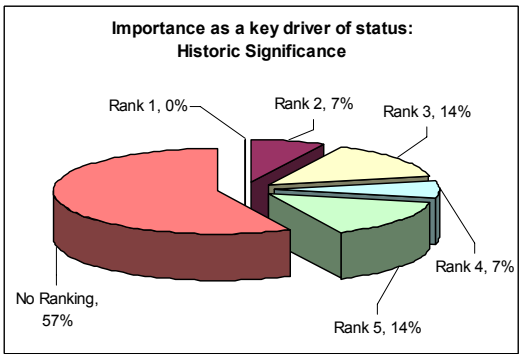


Chart 7.7 Historic significance

Per Charts 7.5, 7.6 and 7.7 we can see that no ranking has been given to 'Financial return', 'Size by area or volume' and 'Historical significance' by 50% or more of the facilities. SOH also gave no ranking to 'Financial return' and 'Historical significance'. In global terms it would seem these issues are of less relative importance when determining facility status.

As to what non-facilities management issues / aspects that the facilities measure, financial issues (this is not surprising since it is a 'norm' for all organisations to conduct financial measure- i.e. financial accounting for profit and loss), and one each claiming that they measure a range of other issues such as organisational, contracts, procurement, OHS, environmental, and regulatory compliance, timely return on personnel, percentage of budget expended, visitor numbers, attendance of performances, cost recovery ratios and customer satisfaction ratio. SOH identified 'diversity of performances and audiences' a Rank-2 status driver.

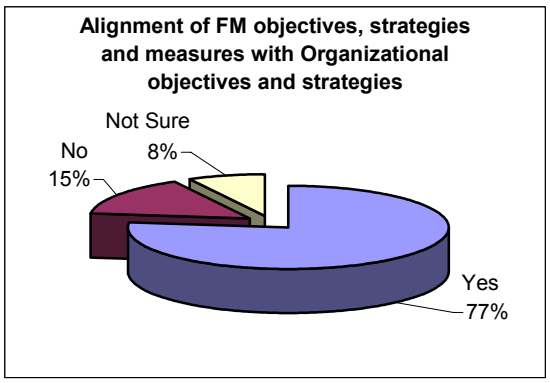


Chart 8: Alignment of FM objectives, strategies and measures with organisational objectives and measures

77% of the facilities states that FM objectives, strategies and measures are aligned with their organisational objectives and strategies (Chart 8), while 15% declined to answer and 8% were not sure. SOH was not sure whether FM objectives, strategies and measures are aligned with its organisational objectives and strategies.

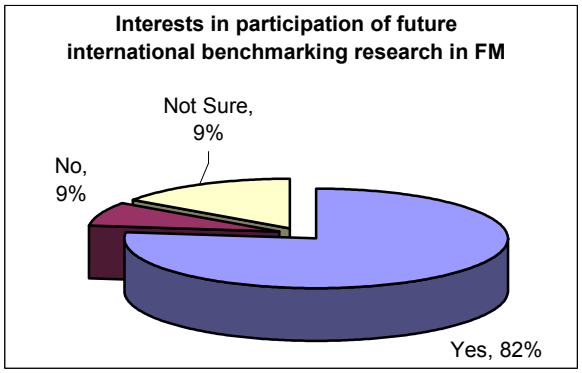


Chart 9: Interested in participation of future international benchmarking research in FM

It is encouraging that 82% of the facilities are interested in future international FM benchmarking research, while 9% are not sure and the remaining 9% declined the opportunity. How this future research is achieved (e.g. via balanced scorecard or other approach) has to be examined to determine the most efficient approach with consideration of effective validation of derived FM benchmarks.

6. Conclusions

Benchmarking is a crucial decision making tool for organisations and processes, however the application FM benchmarking is not widespread or consistent.

The FM Exemplar Project using the Sydney Opera House has conducted a two (2) stage benchmarking survey. This international research has developed a benchmarking framework with the focus on the maintenance performance in iconic and / or performing arts centre facilities. Benchmarking data has been collected from Sydney Opera House and other participants with similar core business and / or FM functions. The initial responses (15 No.) to Survey Stage 1 have identified that the Pareto or highest order items which should be considered core to an FM benchmarking framework would include;

Focus Area	Ranked KPIs
A. Condition Assessment	1. Building structure and services 2. Public spaces 3. Internal fittings and internal finishes
B. Energy Management	1. Rate of consumption 2. Management systems
C. Accessibility	1. Access for people with disabilities 2. Security provisions
D. Contractors' Performance	1. Safety compliance 2. Quality of service 3. Timeliness of service

Table 8: Survey Stage 1 initial analysis of responses

For any organisation the formulation of KPIs and measurement metrics should be tempered by the corporate objectives and culture. For iconic facilities, and specifically performing arts centres, this may require reference to the mission of vision or such issues as the "six areas of key performance for arts centres;

- Recognition for excellence
- Value for money
- Pride in a key symbol
- 'the experience'
- Artistic and industry development
- Access and equity" (Radbourne 1998)

Beyond this the Survey Stage 1 responses have also identified the high level Status Drivers (by ranking) as;

1. Functionality
2. Landmark status
3. Operational efficiency
4. Cultural heritage

The Survey Stage 2 has now been sent to Stage 1 respondents to elicit more detailed data particularly in the areas of condition assessment and energy management.

Current benchmarking research will continue to seek input from the surveys so to increase the robustness of the results.

Future work will continue Survey Stage 2 to collect the data of maintenance performance and procurement process for analysis and comparison. It will set benchmarks for multi-level performance of maintenance to assist facilities management in understanding how they influence the integrated performance and the success of maintenance. The benchmarking database will be extended with the latest data and structured in a proper way for future link with the building information model of Sydney Opera House. The project output is intended to be an FM benchmarking framework which could have applications to benefit the broader FM industry.

It is likely further investigation will be required beyond the FM Exemplar Project to implement and maintain the FM benchmarking framework.

7. Appendices

7.1 Benchmarking Survey Stage 1

By returning this questionnaire you are agreeing to the terms set out in the covering letter. Please complete the following as appropriate, approximations are acceptable where details are not available.

General Information

Name of the facility		
Current owner of the facility		
Facility age / Year completed	Original:	Refurb:
Total floor area (entire facility)	Gross:	Net:
Total floor area (performing arts spaces)	Gross:	Net:
Total number of seats (performing arts spaces)	Base:	Expanded:
Total number of employees (excluding FM)	Full-time:	Part-time:
Total number of employees (FM only)	Full-time:	Part-time:
Are Facilities Management services outsourced ?	Yes / No*	
	Fully / Partial / not applicable*	

**** delete as appropriate***

Benchmarking of Facilities Management

1.	Are you currently involved in any benchmarking exercises in facilities management?	
	➢ Yes ☐ → Go to Question 2 and 3.	➢ No ☐ → Go to Question 3.

2.	Which of the following best describes the above-mentioned benchmarking exercise?	
	a. Internal benchmarking (i.e. assessing the performance of the facility within itself, e.g. seeking to improve past performance)	☐
	b. External benchmarking (i.e. comparison with single / multiple* partner / non-partner* organisations / facilities*) *delete as appropriate	☐
	c. Both internal and external	☐

3.	Is your facility or organisation currently involved in any benchmarking exercises on any other areas / issues (apart from facilities management)?	
	➢ Yes ☐ → Please elaborate	➢ No ☐

Facilities Management Performance Data and Metrics

4.	Which of the following issues does your organisation regard as key indicators of facility performance, please note if you currently collect data to evaluate the performance of specific issues? (Please select ✓: you may select more than one per area and provide more detail if necessary)							
	a. Condition Assessments							
	Building Structure (e.g. façade, roof, columns, beams)	☐	Internal fittings (e.g. doors, handrails, stairs, escalators)	☐	Internal finishes (finishes: e.g. floors, ceilings, walls)	☐	Outdoor Elements (e.g. furnishings, paving, landscaping, signage)	☐
	Building Services (e.g. mechanical, electrical etc.)	☐	Performance spaces	☐	Public spaces	☐	Office spaces	☐

	B. Energy							
	Supply quality and availability	☐	Generation and Transmission	☐	Rate of consumption	☐	Management systems	☐
	c. Accessibility							
	Signage provisions	☐	Information provided to visitors	☐	Information provided to staff	☐	Access for people with disabilities	☐
	Security provisions	☐	Vehicular parking provisions	☐	Public transportation links	☐	Affordability for the general public	☐
	d. Contractors' Performance							
	Compliance and contractual terms and conditions	☐	Safety (adherence to safe working practices)	☐	Expenditure (adherence to budget)	☐	Timeliness (adherence to schedule)	☐
	Responsiveness to changing needs	☐	Quality of Service	☐	Risk management	☐	Value for money	☐
	e. Other Indicators, please explain							

5.	Please rank in order of importance (1-5, being highest to lowest) the key drivers for the status of your facility;							
	Cultural heritage	☐	Landmark status	☐	Financial return	☐	Functionality	☐
	Size, by area or volume	☐	Operational efficiency	☐	Historic significance	☐	Other, ? ……. …… …	☐

6.	What non-facilities management issues/aspects do you measure? (e.g. organisational, financial, contracts, procurement management etc.)

7.	Are your facilities management objectives, strategies and measures aligned with your organisational objectives and strategies?		
	➢ Yes ☐	➢ No ☐	➢ Not Sure ☐

8.	Would your facility or organisation be interested in participating in further international benchmarking research in facilities management ?		
	➢ Yes ☐	➢ No ☐	➢ Not Sure ☐

Please complete and return this form to Stephen Ballesty, sballesty@riderhunt.com.au
or fax to +61 2 9957 4197 by 10th May 2006.

Thank you.

7.2 Benchmarking Survey Stage 2

By returning this questionnaire you are agreeing to the terms set out in the covering letter. Please complete the following as appropriate, approximations are acceptable where details are not available.

General Information

Name and Designation	
Email address/Telephone No.	
Name of the facility	
Current owner of the facility	

1.	**Does your facility or organisation currently collect data of the following for the evaluation of facilities management performance?** ***(Please select ✓)***
a.	Condition Assessments
i.	The condition of individual building elements/assets
	Yes □ No □
ii.	The state of presentation (e.g. cleanliness and/or tidiness)
	Yes □ No □
b.	Energy
	Yes □ No □
c.	None of the above ***→ please answer Q11-14 ONLY.***

2.	**Which of the following issues under Condition Assessment and Energy does your facility collect data on?** **(You may select ✓ more than one issue)**							
a.	Condition Assessments							
	Building Structure (e.g. façade, roof, columns, beams)	□	Internal fittings (e.g. doors, handrails, stairs, escalators)	□	Internal finishes (finishes: e.g. floors, ceilings, walls)	□	Outdoor Elements (e.g. furnishings, paving, landscaping, signage)	□
	Building Services (e.g. mechanical, electrical etc.)	□	Performance spaces	□	Public spaces	□	Office spaces	□
	Others (please elaborate): _____ _____ _____							
b.	Energy							
	Supply quality and availability	□	Generation and Transmission	□	Rate of consumption	□	Management systems	□
	Others (please elaborate): _____ _____ _____							

3.	**Which of the following criteria does your facility currently use to conduct Condition Assessments?**	
	(You may select ✓more than one)	
a.	Overall Impression	□
b.	Tidiness	□
c.	Cleanliness	□
d.	Wear and Tear	□
e.	Others: _____ _____	□

4.	**Which of the following term(s) does your facility currently use to represent your Condition Assessment evaluations?**	
	(You may select ✓more than one)	
a.	Asset Condition Index	□
b.	Facilities Condition Index	□
c.	Building Condition Index	□
d.	Building Fabric Index	□
e.	Building Presentation Index	□
f.	Others: --- --- ---	□

5.	**Which of the following criteria does your facility currently use to evaluate Energy?**	
	(You may select ✓more than one)	
a.	Simple data measures such as Energy consumption/usage per m2 (or person etc.)	□
b.	Engineering assessment/Computer modelling/simulation:	□
b.i.	▪ Used to compare the organisation itself against a design standard (for e.g. original design intent, building codes, past performances of the facility etc.)	□
b.ii.	▪ Used to compare the organisation with other similar organisations	□
b.iii.	▪ Used to compare the organisation with other dissimilar organisations	□
c.	Others: --- --- ---	□

6.	**Average Annual Rate of Energy Consumption (*delete as appropriate)**			
a.	Electricity	:	KW per m2/hr/audience/visitor/performance*	_____per year
b.	Water	:	KLitres per m2/hr/audience/visitor/performance*	_____per year
c.	Gas	:	MJ per m2/hr/audience/visitor/performance*	_____per year

7.	**Did you use an industry standard or modelling system to assist in the development of your energy management/rating system? (Yes or No, if Yes please provide details)**
	_____ _____ _____ _____ _____

8.	**Which of the following best describes the scoring/rating system your facility uses to conduct the assessments?** ***(Please select ✓only one for each row)***					
		Manual Assessment			**Automatic Assessment**	
		Short cycle scoring of everything using a simple range of scores for each criteria used.	Extended interval between assessments with scoring being more detailed.	Items obtaining a score below a certain value will receive more detailed assessment.	Using sensors and monitoring systems.	None
a.	Condition Assessments					
i.	Condition of individual building elements/assets	□	□	□	□	□
ii.	State of presentation	□	□	□	□	□
b.	Energy	□	□	□	□	□
c.	Please elaborate here if none of the above descriptions are suitable:	--- --- --- --- ---				

9.	**How regularly are the assessments conducted?**						
		(You may select ✓more than one)					
		Daily	**Weekly**	**Monthly**	**Quarterly**	**Annually**	**Others: please state**
a.	Condition Assessments						
i.	Condition of individual building elements/assets	□	□	□	□	□	_____
ii.	State of presentation	□	□	□	□	□	_____
b.	Energy	□	□	□	□	□	_____

10.	**Who conducts the assessments?** **Select the parties who are tasked with conducting regular assessments.**					
		(You may select ✓more than one)				
		Internal Staff	**Consultants**	**Contractors**	**Visitors/Customers (via Surveys/Interviews)**	**Others: please State**
a.	Condition Assessments					
i.	Condition of individual building elements/assets	□	□	□	□	_____
ii.	State of presentation	□	□	□	□	_____
b.	Energy	□	□	□	□	_____

11.	**Apart from Condition Assessments and Energy, what facilities management functions does your organisation currently collect data on or measure performance?** **List 3 others that are most important to your organisation.**
	--- --- ---

12.	**What other aspects of facilities management does your organisation not currently collect data on or measure, but intends to in the future (i.e. apart from those already mentioned previously)?**
	--- --- ---

13.	**What non-facilities management issues/aspects do you not currently collect data on or measure, but intend to in the future (e.g. organisational level management issues, contracts management, procurement management etc.)?**
	--- --- ---

14.	**Would your facility be interested in joining a confidential international facilities benchmarking network for the purpose of conducting further more in-depth studies for the sharing of facilities management knowledge?**
	Yes □ No □

Please complete and return this form to Stephen Ballesty, sballesty@riderhunt.com.au
or fax to +61 2 9957 4197 by 26th May 2006.

Thank you.

7.3 Status Key for Survey Stage 1 & 2 as at 19th May 2005

Status key

- Invited to participate (81)
- Reminder sent / Follow-up (42)
- Acknowledgement of receipt (5)
- Waiting for Response (6)
- Declined opportunity (13)
- Completed survey 1 returned (15)
- Completed survey 2 returned (3)

No.	Facility / Organisation	City	Country	Invited by	Last Follow-up
1	Rialto Towers	Melbourne	AUSTRALIA	S Ballesty	M Tonelli 11/4/06
2	Federation Square	Melbourne	AUSTRALIA	S Ballesty	M Tonelli 29/4/06
3	Australian Parliament House	Canberra	AUSTRALIA	S Ballesty	
4	Queensland Performing Arts Centre	Brisbane	AUSTRALIA	S Ballesty	M Tonelli 11/4/06
5	Adelaide Festival Centre	Adelaide	AUSTRALIA	S Ballesty	
6	Melbourne Arts Centre	Melbourne	AUSTRALIA	S Ballesty	M Tonelli 11/4/06
7	Sydney Opera House	Sydney	AUSTRALIA	SB / P Akhurst	
8	Telstra Stadium	Sydney	AUSTRALIA	S Ballesty	
9	Palais des Congres	Montreal	CANADA	P Scuderi	
10	Place des Arts	Montreal	CANADA	S Ballesty	M Tonelli 22/4/06
11	Roy Thompson Hall	Toronto	CANADA	S Ballesty	M Tonelli 22/4/06
12	CN Tower	Toronto	CANADA	S Ballesty	
13	Royal Danish Theatre	Copenhagen	DENMARK	S Ballesty	
14	Bibliotheque Francois Mitterand	Paris	FRANCE	P Scuderi	M Tonelli 3/5/06
15	Opera National de Paris - Opera Bastille	Paris	FRANCE	P Scuderi	
16	Opera National de Paris - Palais Garnier	Paris	FRANCE	P Scuderi	
17	Philharmony Berlin	Berlin	GERMANY	S Ballesty	
18	Beethovenhalle Bonn	Bonn	GERMANY	S Ballesty	M Tonelli 22/4/06
19	Jewish Museum	Berlin	GERMANY	S Ballesty 27/4/06	
20	Gewandhaus	Leipzig	GERMANY	S Ballesty	M Tonelli 11/4/06
21	Gasteig (includes Philharmonie Munchen)	Munchen	GERMANY	S Ballesty	
22	Arcimboldi Opera Theatre (la Scala II)	Milan	ITALY	P Scuderi	M Tonelli 22/4/06
23	Pirelli Real Estate Headquarter	Milan	ITALY	P Scuderi	
24	Comune di Rimini	Rimini	ITALY	M Tonelli	M Tonelli 22/4/06
25	Pinacoteca Giovanni e Marella Agnelli	Turin	ITALY	P Scuderi	
26	Petronas Tower	Kuala Lumpur	MALAYSIA	S Ballesty	M Tonelli 22/4/06
27	Concertgebouw, Congressgebouw	Rotterdam	NETHERLANDS	S Ballesty	
28	SkyCity Auckland	Auckland	NEW ZEALAND	S Ballesty	M Tonelli 11/4/06
29	Town Hall, Christchurch	Christchurch	NEW ZEALAND	S Ballesty	M Tonelli 22/4/06
30	The Edge	Auckland	NEW ZEALAND	S Ballesty	M Tonelli 13/4/06
31	The Jin Mao Tower	Shanghai	PR CHINA	S Ballesty	M Tonelli 11/4/06
32	The Hong Kong Convention & Exhibition Centre	Hong Kong	PR CHINA	S Ballesty	M Tonelli 11/4/06
33	The Scottish Parliament	Edinburgh	SCOTLAND	S Ballesty 6/4/06	
34	The Esplanade - Theatres on the Bay	Singapore	SINGAPORE	P Akhurst / J Wu	
35	Palau de la Musica Valencia	Valencia	SPAIN	S Ballesty	M Tonelli 22/4/06
36	Guggenheim Museum Bilbao	Bilbao	SPAIN	S Ballesty 27/4/06	
37	HSB Turning Torso	Malmo	SWEDEN	S Ballesty	
38	Swiss Reinsurance Company	Zurich	SWITZERLAND	S Ballesty 27/4/06	
39	Taipei 101	Taipei	TAIWAN	S Ballesty	
40	Culture Centre	Taipei	TAIWAN	S Ballesty	M Tonelli 22/4/06
41	Baiyoke Sky Hotel	Bankok	THAILAND	S Ballesty	M Tonelli 22/4/06
42	Burj Al Arab	Dubai	UAE	S Ballesty	M Tonelli 11/4/06
43	Jumeirah Beach Hotel	Dubai	UAE	S Ballesty	
44	Lowry on Salford Quays	Salford	UK	S Ballesty	M Tonelli 29/4/06
45	Millennium Centre	Cardiff	UK	P Akhurst	
46	St. David's Hall	Cardiff	UK	S Ballesty	M Tonelli 22/4/06
47	The Lloyd's building	London	UK	M Tonelli 29/4/06	
48	Imperial War Museum North	Manchester	UK	S Ballesty 27/4/06	
49	Portcullis House	London	UK	S Ballesty	
50	Royal Albert Hall	London	UK	P Akhurst	D Leifer 8/3/06
51	Royal Opera House, Covent Garden	London	UK	P Akhurst	D Leifer 8/3/06
52	Royal Festival Hall	London	UK	S Ballesty	M Tonelli 13/4/06
53	Royal Shakespeare Theatre	London	UK	S Ballesty	D Leifer 8/3/06
54	Meyerhoff Symphony Hall	Baltimore	USA	S Ballesty	
55	Orange County Performing Arts Centre, Segerstror	Costa Mesa	USA	S Ballesty	M Tonelli 22/4/06
56	Boettcher Conservatory	Denver	USA	S Ballesty	M Tonelli 13/4/06
57	Tanglewood, Music Shed	Lenox	USA	S Ballesty	
58	Minneapolis Orchestra Hall	Minneapolis	USA	S Ballesty	
59	Avery Fisher Hall, Lincoln Centre	New York	USA	S Ballesty	M Tonelli
60	Empire State Building	New York	USA	S Ballesty	M Tonelli 13/4/06
61	Guggenheim Museum	New York	USA	S Ballesty	M Tonelli 10/4/06
62	Madison Square Garden	New York	USA	S Ballesty	
63	Metropolitan Opera, Lincoln Centre	New York	USA	S Ballesty	M Tonelli 22/4/06
64	Kimmel Center	Philadelphia	USA	S Ballesty	M Tonelli 22/4/06
65	Abravenel Hall	Salt Lake City	USA	S Ballesty	M Tonelli 22/4/06
66	Davies Symphony Hall	San Francisco	USA	S Ballesty	M Tonelli 22/4/06
67	The Space Needle	Seattle	USA	S Ballesty	M Tonelli 11/4/06
68	The Sears Tower	Chicago	USA	S Ballesty	M Tonelli 10/4/06
69	The John Hancock Center	Chicago	USA	S Ballesty	
70	Indianapolis Museum of Art	Iandianapolis	USA	S Ballesty	M Tonelli 10/4/06
71	The J Paul Getty Trust	Los Angeles	USA	S Ballesty	M Tonelli 10/4/06
72	Kimbell Art Museum	Forth Worth	USA	S Ballesty	M Tonelli 10/4/06
73	Smithsonian National Air & Space Museum	Burke	USA	S Ballesty	
74	The Field Museum	Chicago	USA	S Ballesty	M Tonelli 10/4/06
75	Smithsonian Institution	Burke	USA	S Ballesty	M Tonelli 10/4/06
76	Colonial Williamsburg	Williamsburg	USA	S Ballesty	M Tonelli 10/4/06
77	Williams Tower	Houston	USA	S Ballesty	M Tonelli 10/4/06
78	Bank of America Tower	Houston	USA	S Ballesty	M Tonelli 10/4/06
79	Wells Fargo Plaza	Houston	USA	S Ballesty	M Tonelli 10/4/06

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