

Application of Cost management principles to strategic program planning, project planning and asset management (an Australian experience)

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ABSTRACT

The application of Cost management principles to Capital Works planning, Investment decision making and Asset management is becoming widely adopted and recognized for its value addition.

This paper looks at some live examples where such principles are being applied to the forward planning of programs and projects as well as the on-going management of building facilities and other assets by Australian government departments responsible for healthcare, justice and tertiary education.

In particular it will provide some insights into the contribution by the author and his associates to the development and updating of the examples which include:

- Program and Project Planning Benchmarks used for Capital works investment assessment and funding allocation
- Benchmarks used for Life cycle or Cost in use investment or Recurrent cost investment allocation
- Asset Condition assessment & reporting used for forward maintenance planning and investment prioritizing
- Asset Replacement Cost Benchmarks used for insurance valuation purposes

The paper will include an outline of the benchmarking principles and processes used as well as the results which are helping agencies to better plan future investments as well as more effectively manage and maintain such assets over their entire life cycle.

Keywords: Cost management, Asset management, Investment, Benchmarking

1 INTRODUCTION

1.1 General background

Over recent decades, Australia like elsewhere in the world, has seen the dismantling of many central government agencies involved in the management of public works. This transition has encouraged the evolution and growth of private sector professions especially project management and quantity surveying consultancies. Another consequence has been that the government agencies responsible for service delivery, such as education, housing, healthcare and justice have taken on some of the forward planning, policy and investment roles associated with the associated capital works management and long term asset management.

In relation to forward planning and investment, the abovementioned government agencies are answerable to the central treasury and finance departments for meeting good governance protocols including various predetermined procedures for undertaking business case, design reviews, audits and reporting.

As a response to these requirements the government agencies have sought efficient and flexible ways to help them set long term targets for services as well as the associated capital and recurrent investment based on forecast changes in demographics and changes in service delivery models etc.

In parallel with these trends the consulting industry has moved to position itself as the keeper of relevant benchmarks especially data which can be used for such forecasting and target setting. Such data is derived from analysis of actual projects under their management and accumulated over time.

The author was a principal of one such consultancy company which over more than three decades had built a strong reputation for high quality cost management services and had developed a knowledge of several institutional sectors including Aged care, Healthcare, Tertiary education, Police and Justice.

At a time when the government agencies needed to develop planning tools they sought help from the consulting industry. The author's company was already providing total cost management services for individual projects and as a result had accumulated a significant database. In the case of healthcare sector this database was derived from over four hundred individual projects. The consultancy had also initiated its own benchmarking studies which provided a useful starting point for meeting the government agencies requirements.

1.2 Client agency context

The Department of Health (DOH - formerly Department of Human Services) is responsible for the delivery of health and community services to the 5 million residents across the Australian state of Victoria.

DOH treats approximately 1million inpatients each year within its 150 hospitals, aged care and community centres. Bed numbers total around 14,500. The built up area of its assets total around 1.3m m2.

DOH has a government funded on-going capital works expansion and upgrade investment program which involves an investment of about US\$250million annually.

RMIT University (RMIT) is a leading tertiary education institution founded in 1877 which has three primary campuses under its management as well as regional and overseas campuses in Vietnam and Spain. It has an enrolment of 82,000 students.

RMIT receives government funding towards its recurrent expenditure as well as its facility investment needs. It also derives revenues from overseas full fee paying students and other private sources.

1 INTRODUCTION (CONTINUED)

1.3 Definitions

Program planning – Used by large institutions and corporations to plan for an on-going investment program involving multiple projects over an extended period.

Benchmarks, Benchmarking - A standard or point of reference against which things may be compared or assessed (Oxford Dictionary)

2 CASE STUDIES

2.1 Program and Project Planning Benchmarks

DOH needed a planning tool which would enable them to efficiently and accurately predict future hospital facility needs given its planned expansion in response to demographic trends. Their requirements brief included the following objectives;

- To promote the equitable distribution of (limited) public capital resources – on an activity basis
- To provide a basis for setting realistic forward program budgets
- To provide a basis for setting realistic individual project budgets
- To provide a defensible basis for setting departmental space and cost targets
- To provide a tool for comparing project performance

In order to develop the planning benchmarks DOH appointed a project team comprising architects, engineers, quantity surveyors and a project manager each of whom had considerable healthcare project experience with the agency and had access to relevant databases. DOH separately appointed an IT consultant to develop a computer model which would enable the department's officers to utilize the data and produce forecasts.

The project team approached the study using the following process;

- National & International research
- Analysis of standards and guidelines
- Analysis of selected completed projects (50 at high level and 12 in detail)
- Development of Planning model in conjunction with service planners
- Development of proposed benchmarks
- Testing model against completed projects

Arising from the initial research and analysis a Planning model was developed which reflected the accepted planning process and in particular its logical sequence as follows; 1. Service plan, 2. Functional plan, 3. Space plan and 4. Cost Plan (for both Building & Equipment).

The model was designed on the premise that the output from the Service plan becomes the input to the Functional plan and so on in sequence. This premise was founded on the accepted approach to facility planning.

The study team worked closely with the department's own service planners to a) Define levels of hospital complexity and to b) Define Functional & Planning Units. These definitions were largely in common usage for hospital service planning and hospital facilities planning in Australia and elsewhere.

They also studied other references including standards, planning and design guidelines and compared these with the selected project datasets.

Our initial research found that whilst Functional, Area and Cost benchmarks were in common use (Nationally/Internationally) there was no evidence of Integrated - Service/Functional/Area/Cost planning benchmark models and equally importantly there was no evidence of Activity - Linked benchmarks.

2 CASE STUDIES (CONTINUED)

2.1 Program and Project Planning Benchmarks (Continued)

From a building economics perspective the study found that overall hospital Cost per bed - varied by up to 250%, Individual Functional (departmental) Cost per floor area unit (m²) - varied by approx 150% and even a typical Comparable department Cost per floor area unit (m²) - varied by up to 34% across different hospital types and building configurations. Cost per bed had in the past been the conventional basis on which programs were funded and investment planning made. This study demonstrated it was necessary to create a new model which had much greater sensitivity.

As a consequence the hospital planning benchmark model was refined using departmental floor areas as a primary driver but also taking account of;

- Type of Hospital (Role Delineation or complexity)
- Type of Department (Functional unit or Planning unit)
- Type of Patients (Same Day or Multi Day)
- Building configuration (no of floors etc)
- Type of building works (new build, refurbishment) etc
- Standards & quality of materials & equipment
- Locality of site, Timing of Project, Procurement method

A more detailed presentation of the original development of this model was presented at the ICEC 2004 World Congress in Capetown (*Cox and Rofe*).

2.2 Life Cycle Planning Benchmarks

RMIT had embarked on an investment program involving upgrade of its existing building assets as well development of new facilities on its greenfield campuses. RMIT wanted to be at the forefront of design innovation generally was specifically promoting sustainable design. It had produced some widely acknowledged and award winning university buildings.

The author's company was involved in cost management of two such building projects, one a new 9,500m² Education and Research centre at Bundoora in Melbourne and one a total upgrade and change of use for a 4,500m² Laboratory building at RMIT's city campus. The university's projects division decided the two projects presented a unique opportunity to research and develop a whole of life cost plan for each building and use this study as a benchmark for future project planning.

We referenced the then recently published – Volume 4 Life Cycle Costing of the Australian Cost Management Manual produced by the Australian Institute of Quantity Surveyors (AIQS) and consulted with a leading academic and AIQS member on the subject, Mr Craig Langston.

A spreadsheet based cost model was created based on the capital cost plans which had been prepared by us separately for each project. The Cost Plans had also been prepared in accordance with the Australian Cost Management Manual. For the Life Cycle plan we adopted an identical breakdown of components (sub elements). For this study the Life costs included – repairs, maintenance and periodic replacements as well as energy and other running costs. RMIT chose to exclude the salary and associated operating costs of its Facilities maintenance department.

Life expectancy assumptions and maintenance policies were found to represent the biggest variables. The model demonstrated that for every dollar invested in initial capital RMIT can expect to spend around \$0.25c in recurrent costs over a twenty year of operations and a further \$0.56c in running costs (expressed in present value terms).

From a building economics perspective the study found that 70% of life cycle costs are related to the plant and energy systems (of which 2/3 is energy related).

2 CASE STUDIES (CONTINUED)

2.3 Asset Condition & Maintenance Planning Benchmarks

DOH needed a planning tool which would enable them to understand the overall condition of its state-wide Hospital building assets and predict future maintenance and re-instatement cost liabilities. Maintenance and reinstatement normally forms just part of a redevelopment of such buildings which are upgraded (or replaced) for a variety of reasons including change in demand and use, change in service delivery models and or change in available technologies.

DOH appointed a project team comprising architects, engineers, quantity surveyors and a project manager to develop the condition assessments.

A Condition report was initially produced by the team for which five condition scenarios were considered and expressed as indices – for each hospital campus.

The Author's associates developed maintenance and reinstatement cost benchmark rates for each scenario and applied them to the respective condition assessment and gross floor area of each hospital. Their report identifies the required investment at each hospital and overall were such work to be undertaken.

The maintenance and reinstatement forecasts were also compared with the total replacement costs for each campus and state-wide. In addition to the budgetary findings, the study also identified campuses in greatest need as well as highlighting those for which further investigation of a total replacement scenario was warranted.

2.4 Asset Replacement Cost Benchmarks

As part of its obligations to the parliament and department of treasury and finance DOH is required to produce a valuation each year of its Assets. Such valuation includes the replacement cost of its hospital building portfolio.

Whilst the actual valuation work is undertaken by the relevant Valuer Generals Department in Victoria DOH wanted to ensure the replacement costs used by the valuers were derived from soundly based data. DOH appointed the author's consultancy to develop the benchmark rates with regard to the earlier Planning benchmark studies so that a consistent methodology was used.

The author and his associates developed such replacement cost benchmark rates for each hospital type and building classification. The rates were separately analysed into;

- Building structure and shell
- Building fitout
- Building services
- Central Plant

A state-wide locality factor index was also proposed with reference to the widely accepted Rawlinsons price book which is in common use throughout Australia.

3 RESULTS AND LESSONS LEARNED

Following its completion in 2004 DOH implemented the Planning Benchmark model following a period of model testing. It has since been reviewed and refined on two occasions. The author has been involved in the original model development and each of the subsequent reviews. The model has also

subsequently been expanded and adopted for hospital planning by each of the Australian states. DOH reports that the model has fulfilled its objectives as well as enabling the department to more accurately develop forward funding programs and also more critically examine project proposals including the creation of Public sector comparator for all Public Private Partnership (PPP) proposals.

The Planning Benchmark model also formed the basis for development of the Asset Maintenance and Asset Replacement cost models also used by DOH. The Asset Condition model has provided a sound basis for the establishment of sinking funds and maintenance budgets.

RMIT University initially saw its Life Cycle Planning study as a basis for informing future design stage decision making so that a whole of life perspective could be applied as part of its commitment to evidence based design. The university's separate Facilities management division has since examined the study and is using the results for producing more accurate forward maintenance plans and budgets.

Each of planning benchmark models has contributed to the more accurate planning of capital investment targets as well as the more effective management of Building and associated Equipment assets. In addition the models have demonstrated benefits which include;

- Promoting "best overall value" rather than just "lowest initial cost" solutions
- Encouraging more effective/efficient designs
- Controlling excessive "user demands" for more space and more investment
- Providing a sustainable foundation for project budget setting

One of the unexpected benefits has been the ability to critically examine the utilization of existing facilities and therefore ensure existing asset use is optimized and future investment is soundly based.

A fundamental requirement for each study has been the need to make the models robust and user friendly enough such that non-cost management professionals can use them with reasonable confidence.

4 CONCLUSION

Based on the studies underpinning this paper and the associated feedback from the agencies using them on a day to day basis the Author believes there is a valuable role for planning benchmark models to play in the on-going management of capital works and associated asset management. This conclusion applies equally to both major government departments and large corporations as well as not-for-profit institutions having a large property portfolio. The professional quantity surveyor or cost engineer is well placed to contribute to the development of all or any such models.

Like any assessment based on benchmarks (or a price book) the author considers there is some risk around the creation of investment budgets and believes they should be undertaken with due caution and if possible subject to independent review and or third party validation.

The author also considers the tools described in this paper are only applicable to the front end or program planning phases and more particularly pre-project phases. He does not consider any of these tools are a substitute for the widely accepted and proven total cost management processes being applied as part of prudent project implementation practice.

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6 REFERENCES

- Cox, P. and Rofe, L. 2004, *Hospital project planning benchmarks*, (ICEC Capetown).
AIQS, 2006, *Australian Cost Management Manual – Volumes 1-6*, (Australian Institute of Quantity Surveyors)
Rawlinsons, 2014, *Rawlinsons cost guide*, (Rawlinsons publishing)