

Building Business-Based Service Levels for IT Outsourcing Contracts: The Measure to Manage (M2P) Performance Measurement System

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Abstract. This paper describes the development of the Measure to Manage Performance (M2P) method for preparing Service Level Agreements for IT outsourcing contracts in the Australian Government sector.

This method links the payment for the provision of services that support business applications with an assessment of penalties or bonuses that reflect the quality of these services in business terms. The method follows the principles for measurement developed from experience and from the literature concerning IT Effectiveness, IT Balanced Scorecards, and IT Investment. It was developed, after considerable effort, to provide the “end-to-end, business-based” measurement system that has been required in contracts but not yet delivered.

I. WHAT IS NEEDED

The work described in this paper started with a joint approach to me by a Government organization and its provider of Information Technology services, seeking improvements in the use of their Service Level Agreement. Both parties realized that something had to be done but they did not know what to do. This feeling is present for several other IT outsourcing contracts between Australian Federal Government agencies and their IT service providers.

These parties had a sole-supplier outsourcing contract covering all aspects of IT over five years. The contract was for a ‘partnering’ approach but it was rigorous contract and had tight contract management, as recommended by authorities such as Lacity and Hirschheim [1] and Willcocks and Lacity [2].

As for ‘traditional’ methods ([3], for but one example) and the many other IT Outsourcing contracts currently in use in the Federal Government sector, this contract contains a Service Level Agreement that specifies performance in component-based, technical terms. For example, these contracts describe “Service Levels” for time to respond to a Help Desk call or percentage available time for a server or response time over a Local Area Network segment. If these Service Levels are not met

then “Service Credits” are deducted from the payments made by the client agency. These Service Credits are usually expressed in terms of a percentage of the monthly bill or fixed dollar amounts for each shortfall against a Service Level.

Both the purchasing agency and the provider company know that performance measurement is important in successful IT outsourcing. So their contract has clauses stressing detailed, precise measurement, based upon strong legal advice (see [4] for a public recommendation of ‘sound practice’) and the evidence that the success of outsourcing contracts depends upon service quality being measured and managed [5].

They know that performance measures are an important guide to the required behaviour and it is easy to send the wrong signals. The use of ‘wrong’ performance measures can lead to conflict or to people reacting to where they see the rewards lying rather than where the organization receives the most benefit [6]. So the measures should show rewards for performance that enhance the service rather than punish inadequate performance. They want good service, not the money from penalties imposed for unacceptable performance.

They share the wishes of other Federal Government agencies, in my experience over 10 years with more than 20 tenders, to:

- express the Service Levels in business terms, so that their business managers can monitor their quality and anticipate implications for information management;
- build Business Cases for new initiatives with a full understanding of the implications for service and costs;
- provide encouragement for good performance;
- reduce the risks associated with the provision of services through knowing the areas of service that have the greatest impact upon the business;

- know that they are receiving the performance they are paying for, without it being measured in terms that they do not understand and through tools operated by the provider;
- see the performance “end-to-end”; that is, there are no intermediate measures for components that had to be aggregated in some way to show the performance from the PC to the mainframe;
- use the measures in a charge-back arrangement, so individual business managers can see the bill for their particular areas, even if they do not pay for it directly (so realizing the benefits of IT Chargeback that are described in [7]); and
- be manageable; that is, avoid the present practice of having hundreds of Service Levels.

The purchaser and provider also both know that the traditional approach to measurement of performance does not work well. The wishes listed above are not being met. The traditional approach leads to disputes about what is the actual performance, who is responsible for shortfalls, and how the contract should be interpreted when determining Service Credits. There are constant reports of delays of months in resolving bills arising from these disputes. More importantly, the business managers of the purchaser agency constantly complain that they are not receiving the level of service that they need. Of course, their expectations may be unrealistic and they may be reflecting concerns about the use of outsourcing itself but there is no way of showing, in terms that they understand, that performance is adequate.

There is an implicit acknowledgment that the existing approaches will not work because there are clauses written into every contract in the Federal Government sector for the provider to develop a method for assessing “end-to-end, business-based” measures. Despite such an obligation in the contract, and a long standing desire to introduce better measures, the provider of concern has not been able to suggest acceptable contract performance measures.

Unfortunately, the major advisory firms have not been able to make any suggestions either. Actually, they expressed interest in what was developed through this work because it would be of use to their clients and they had nothing available.

So, the task was to design a system for measuring the performance of the IT services provided under contract that would please both the purchaser and provider by meeting the wishes listed above.

II. WHAT IS AVAILABLE

There are at least three facets of systems measurement that could be used as a basis for designing the measurement system. They are IT Effectiveness, IT

Benchmarking/ Balanced Scorecard, and IT Investment measurement. Elements from each of these facets are useful but not sufficient for the purpose. The measurement of performance carried out by staff from a purchasing agency and a provider under contract is not the same as measuring the performance of internal staff or evaluating investment. The presence of a contract leads to the need for precise expression of requirements and obligations, which will be vetted explicitly and deliberately by lawyers.

The measurement of IT Effectiveness (“Are we getting value for money?”) has been an issue for the life of the IS discipline, of course. The work by [8] did provoke thought about the ultimate measure of value-for-money – that the system is effective for the money that has been expended upon it.

Various frameworks have been suggested for linking IT performance to business value across the enterprise ([9], [10]). As most of this work shows that user satisfaction is a powerful measure, so we wished to incorporate it in our measurement system.

However, many of these measures are too general for use in a contractual arrangement. We need other measures as well.

There has been a flurry of work examining ways of measuring internal performance (“Do we provide value for money?”). This work is mostly based upon the Balanced Scorecard approach of Kaplan and Norton [11]. (This approach is already in use in this purchasing agency for its business operations, so it accepts it.) Examples of the use of the Balanced Scorecard for assessing the performance of internal IT services include Willcox [12] and the US General Services Administration [13], which does give a detailed guideline based upon the Balanced Scorecard for developing IT performance metrics for use in public sector organizations. Other approaches are described in [14]. Similarly, and more pertinently for this project, the Australian National Audit Office [15] has provided guidelines for performance measurement in the Australian public sector. Actually, this area of performance measurement is very large, with many Web-sites dedicated to providing guidelines or tools (see [16], [17]).

These measurements are very useful for determining how to enhance the performance of internal IT staff but can they be used to assess the performance of an external service provider? Many of the quadrants in the Scorecard are hard to apply when measuring contractual performance. For example, how can we assess ‘Learning and Growth’ when it is provided by some other organization? So, we need to be able to link the measures back to the organization’s vision, goals, and objectives but take account of the separation of responsibilities over two organizations.

Similarly, the measures used to assess IT Investments (“Should we buy this service”?) are also useful but not enough for our needs. The chapters in Willcocks and Lester [18] discuss many measurement concepts, such as “Organizational Performance Index” or more interpretive evaluation approaches, as does Bendor-Samuel [19]. Again, we must ask, “how can these measures apply when payments are to be made for very specific statements of work, with every deviation likely to end in a form of financial penalty, for a public sector organization that expends money but has no profit margin and extensive political pressures at work?”.

We needed a measurement system that meets the wishes and makes use of the existing approaches, where appropriate. The following section shows the steps in developing such a contract performance measurement system.

III. WHAT WE DID

Representatives of the purchaser and provider formed a steering committee for the measurement project. We developed a set of evaluation principles to be kept in mind when designing the contract performance measurement system., based upon the academic and professional literature mentioned above.

A. *Service Levels*

The steering committee was keen to develop “five or six” values that could be used to assess the relationship between the two firms, rather than a set of detailed performance measures. Accordingly, we held a series of meetings with members of the purchasing agency to determine their business values. These meetings included a half-day electronic meeting, using the Groupiter ([20]), that developed over 70 possible values, which were arranged into a values tree to show links back to the business objectives and down to particular measures.

However, the steering committee and other members of the agency started to disagree with the level of detail to be captured in the measures. The other members preferred a set of technical measures that could be formed into three quality indices: management, per user, and activity (mainframe applications, mostly).

There was a change in personnel within the steering committee and in other agency personnel. The change led to transferring development of the measurement system from the first agency to another one that shared the same outsourcing contract. This agency had the same wishes for a performance measurement system and took over the project with the same intent and more purpose.

We began to see that neither general relationship measures nor quality indices formed the self-organizing system that we wanted. They did not readily allow for reflecting the different priorities that managers placed

upon the different services that were provided. They did not allow for the impact of loss of service at different times of the working day or peak times in the year.

So, we moved to a system that adjusts payments for services according to the quality of the supply of those services, which was determined from the impact of particular applications at particular times.

B. *Payments and Service Credits*

We had also been exploring salary-based Service Credits to reflect the impact of shortfalls in Service Level. These Credits were based upon the cost to the agency if staff were unable to carry out their work because of unavailable or slow systems. This approach had been put forward in some of the contracts that I had helped to develop as an alternative to the fee percentage or fixed charge arrangements that were in place in most Government contracts.

As well, we considered using value-based pricing [21] or Private Finance Initiatives [22]. One of the major differences between the conditions faced by this purchaser and the organizations using these other pricing approaches was that the purchaser had many tasks supported by many systems. There were too many functions to determine the value added by the provider or the attribution of IT costs to transactions that could be used as a basis for payments. We needed to show how the various IT services supported various business tasks, with some attribution of contribution for charge-back purposes, without having detailed measures of resource allocation.

What we did know was which application used which systems resources (or ‘components’ in the language of the provider, such as mainframe or LAN server or operating system or Help Desk advice). So, we used the link between component and application as the basis for the measurement of quality adjustments to payments. We also kept the principle implicit in these pricing approaches that the size of any penalties or bonus for the quality of service reflected the impact of the performance upon the business.

C. *Satisfaction with Service*

The literature concerning the evaluation of service quality (especially SOFTQUAL [22], based upon SERVQUAL [23]) did provide guidance about measuring the overall performance of the provider. Customer Satisfaction Surveys can act as a general sweeping up of the intangible, over-all views of the agency staff. Accordingly, we developed an on-line questionnaire based upon a sub-set of the questions from SOFTQUAL.

D. *Selling the Method*

As part of the process of both gathering ideas and gaining commitment to the changed measurement system, we held a series of meetings with senior business staff across the country. We presented the description of the

method (as given below) and sought their reactions, both at the time and in follow-up messages.

We had many meetings with purchaser and provider staff. These meetings were used to keep the staff informed, to resolve implementation issues, and to gather the information that is needed to build the measures and their standards. Staff from both organizations have accepted the use of the system, believing that it should lead to better performance.

The method was introduced into operation in January but still in parallel with the operation of the existing system. As at the end of February, the parties are still negotiating over price and performance standards.

IV. WHAT WE HAVE: THE MEASURE TO MANAGE PERFORMANCE METHOD

We built a contract management system called Measure to Manage Performance (M2P) that does reflect the impact of business activities that do not meet the required standard and when these activities were disrupted. The payment for the provided services is measured in the same units as the Service Credits for shortfalls in the required services.

Table 1 shows the differences between traditional performance measurement approaches and the M2P system. The details of the M2P system are given below.

A. Basis for Measurement

The core of the measurement system is an 'activity'. An activity can be a business application, such as a database system or an Office suite. It could be a support activity, such as Help Desk services or preparing a proposal for a new application. The performance of each activity is measured by one or more measures, such as response time for an application or quality of communication about the progress of a project.

B. Parts of M2P

The M2P system comes in three parts:

- A Service Level Agreement that clearly and completely shows responsibilities for providing services and the required standards for the services, in business terms;
- calculations of the payment for the services;
- assessments of quality of service.

Figure 1 shows the flow between the parts of the M2P method used to calculate the activity charges.

The M2P software ensures that changes to activities or measures automatically appear in all Service Level Agreements as well as in the payment models. This integration of the elements of the performance system ensures that the consequences of such changes can be

forecast and that there is no dispute because the Service Level Agreement is at odds with the payment schedules.

Produce Services Level Agreement

The purchaser lists all of the activities that have an noticeable impact upon the agency, taking account of the priority placed upon them and the number of users of the activity. The activities are in turn linked to the services (tasks and the systems components) needed to support the activities.

These links are used to build the Service Level Agreement (SLA), as part of the contract. The SLA describes the services that are the responsibility of the provider and the quality standards for each activity.

The required quality of each measure is also defined in the Service Level Agreement. The definition includes who makes the measurement, using what instrument, to what precision, under what conditions. Each of the measures that are at the core of the system has a standard, defined as an Acceptability Band rather than a single point. For example, response time can have a band between three seconds and five seconds. If the measure falls below the lower limit of the band (five seconds) then penalties are paid. If it falls above the upper limit (three seconds) then a bonus could be payable if it has been determined that this improved performance leads to some benefit, such as staff productivity, to the agency.

The Service Level Agreement also defines the consequences if the standard for an activity is exceeded (bonus) or not met (penalty). These consequences are based upon the priority for the activity, as judged by business managers.

Determine Charges

There are three payments or adjustments. The first payment, as shown at the top of Table 2, is for the management fees that are fixed each month. The second payment is for the number of 'seats' (users of PCs in effect) supported by the provider. The third charge is for the activities that involve mainframe, server, or PC processing.

M2P calculates the payments according to the amount of support provided to the staff carrying out business tasks. The main component of the payment is the Activity User Hour (AUH) charge. The AUH charge depends upon how many people use how many activities for how long, as requested by the Contract Manager at the start of the billing period.

Quality Adjustments for Services

If a user reports the performance of an activity as falling below the Acceptance Band then it is deemed to be "Unavailable to Standard". The time an activity is Unavailable is taken from the report to the Help Desk until

the Help Desk confirms with that user that the activity is now back to standard. M2P uses an automatic 'feed' from the vendor's Help Desk records to determine how long these applications were Unavailable.

If the provider feels that users have unrealistic expectations then they can make the measure as defined in the Service Level Agreement. In the case of response time, the measure is made 'end-to-end' in that it taken

from when a user presses a return key for the application in question until the appropriate response is completed.

If transaction monitors are not available, which is the responsibility, and at the cost, of the provider, then a sample of measures using stopwatches can be used, as it is precise enough. Usually substantiation is not needed, as the activities usually are stopped rather than just slowed when a component fails.

Table 1. Comparison between Traditional and M2P Contract Performance Measurement System

Requirement/ Characteristic	Traditional	M2P
Who makes measure	Provider, using their monitors and instruments	Purchaser, using user reports to the Help Desk
Time of measurement	24 hours, seven days a week, except for scheduled down time	Working hours
Applications measured	All applications	Only those applications with a priority and usage (about 100) above a meaningful amount (about 25 out of 55 possible)
Timing of measurement	All of the time, usually every 15 minutes	When shortfall is observed by user
Measurement band	Measures percentage of performance below a single level. For example, "95% of responses less than 3 seconds", "system available 99.5%"	Measures band of performance. For example, "response time: 5 to 3 seconds"
Express measures in business terms	No, uses technical measures such as "internal host response time", "time to resolve first call", "network transient time"	Yes, use business measures such as 'user response time', 'communication in project management'
Show implications of new initiatives	No connection between technical measures and benefits	Business managers set priority for activities and hence for linked measures
Encourage good performance	Use Service Credits only as penalties	Performance above top of Band can lead to bonus, allows incentives
Show components that have risk for quality of services	Provider is unable to determine which service has the most impact upon Service Credits	Provider can readily see the link between service and Service Credit so that resources can be allocated to match risk
Extent to which measures are 'end-to-end'	Low. Measures are for individual components (mainframe processing, communications, LAN transit, PC processing)	High. Measures are made at the user end and reflect time from user back to user.
Help with charge-back arrangements	Some versions determine resources allocated to activities and calculate costs of resources	Payments, Service Charges, and bonuses are allocated to business areas according to the number of people in those areas using each activity and the priority placed upon that activity by managers
Manageable, with few measures	At least 50 measures, with some contracts having over hundreds	About 10 measures, two of which apply for 20 activities
Allow for business priorities	No link between the loss of service and the business activity dependent upon that service. Penalties often set regardless of the activities involved in the failure	Business managers weight each activity according to the leverage that activity provides to their business area
Allow for when services are not up to required level of performance	No. A failure at 12 at night has the same consequence as a failure at 12 in the day.	Yes. Different times (day, week, or year) carry different weights to reflect the impact upon the users. Losing access to a client's records at a peak time is weighted more than losing that access late at night.

Once a call has been made to the Help Desk saying an activity is below standard then the usual problem resolution tasks are carried out. One of these tasks is the root cause analysis that determines why the activity was not to standard. This analysis identifies the component that failed or the task that was not undertaken properly.

The analysis is also used by a joint purchaser-provider team that forms each month to consider the reports of disruptions from the Help Desk in order to determine the responsibility for the failure, as the purchasing agency is still responsible for application development, which can cause many of the disruptions, especially for enterprise servers. This team acts as the first point of audit to ensure that shortfalls are identified correctly.

Once the joint team identifies the “failed” component, the predetermined links between activities and services show all of the activities that were effected by this failure, even if there were reports from users only about one activity. The failure triggers the consequences given in the Service Level Agreement (see Table 2).

On the other hand, if the provider can show that the standards are exceeded for an activity, then the bonuses described in the Service Level Agreement apply.

As a general rule, the Service Credits are not to be paid in cash (as deductions from the invoices). The purchaser expects the provider to give additional remedial services at no cost to the extent of the Service Credit.

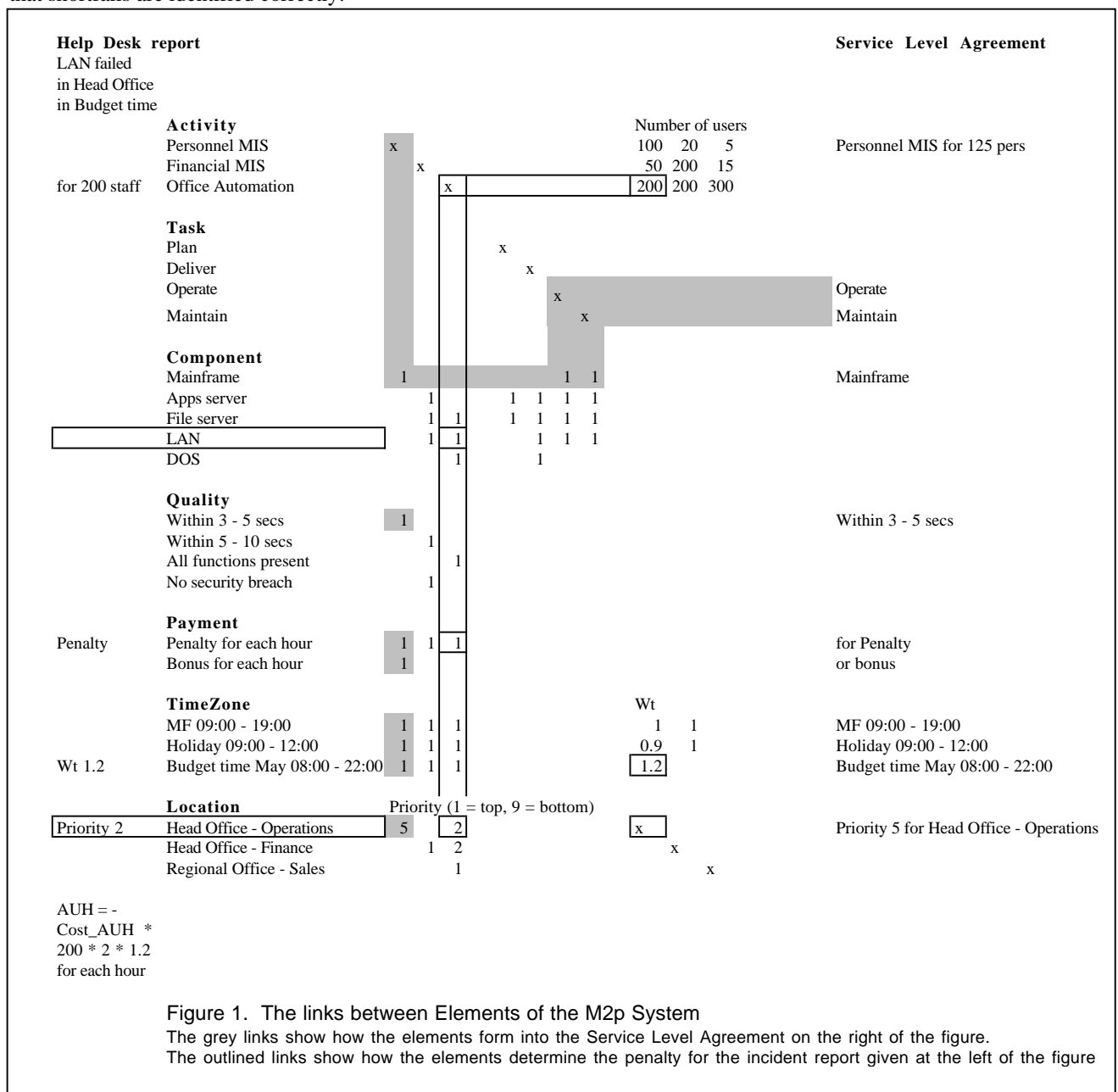


Figure 1. The links between Elements of the M2p System

The grey links show how the elements form into the Service Level Agreement on the right of the figure.

The outlined links show how the elements determine the penalty for the incident report given at the left of the figure

Present Charges in Cost Monitor

M2P presents the charges and the adjustments in a Cost Monitor. There is a Cost Monitor for the Contract Manager, showing the payment and the adjustments for all activities supported throughout the agency. As well, there are Cost Monitors for each of the Business Managers, showing the payments and the quality for the services that are relevant to their activities for their business functions.

Staff Satisfaction

A predetermined percentage of calls to the Help Desk trigger the on-line satisfaction surveys. Once the tasks required by the call have been completed, the callers are asked about the quality of the service that they received. Every six months a percentage of the staff of the agency is asked about their expectations for the quality of service, to

help in the setting of standards. Staff who have not made calls to the Help Desk are asked whether they have no problems or prefer to use the “black Help Desk”.

Other Measures

Not all of the measures are calculated through reports to the Help Desk. The Contract Manager for the purchasing agency monitors the performance in preparing business cases and in communicating the progress of projects. The provider is asked to remedy any shortfalls in these areas as required in the Service Level Agreements.

V. WHAT WE ARE LEARNING FROM THE USE OF THE M2P METHOD

We have learnt, without any surprise, that there are resistances to moving to a new measurement system. The

Table 2. Summary of Service Levels and Credits used in the M2P Contract Performance Measurement System

Management charge Costs that are fixed regardless of the number of users supported or the extent of the provided support. The charge covers such items as account management fees, project management, and preparing Business Cases for new initiatives	
Acceptable (good management)	Unacceptable (poor management /communication)
Pay agreed fixed amount each month + Pay for accepted Business Case + Pay for projects completed ahead of agreed forecast by percentage of number of Activity User Hours for that activity depending upon the project	Activity dependent upon project is deemed Unavailable if project is late and lack of communication leads to agency wasting resources
Seat charge Support of Organizational users, regardless of the size or complexity of the applications used. The support can include Service Desk calls for changes to passwords or basic infrastructure used by all or any application, including procurement of items or restoration of data.	
Acceptable (satisfactory support / service provided)	Unacceptable
Paid agreed amount for each seat for each month + Support calls paid for each call, to agreed “bucket” limit + Service calls paid for each request, unless it was a defect call (report of component failure), which is not charged	Calls above “bucket” (for example, because of inadequate training) not paid Slow response to calls deemed to render Unavailable the activity that is the subject of the call
Activity Time charge Cost of using applications over time, taking account of the resources needed in providing each application (such as remote access, electronic mail, and groupware) or support activity (such as providing detailed advice to end-users)	
Acceptable (Activity available to standards)	Unacceptable (at least one standard not achieved)
Pay for each activity = agreed cost for each activity_user_hour * business leverage for activity * pre-agreed number of users of activity * pre-agreed time of use of activity * weight for time zone + percentage of AUH charge for activities above standard	Adjust payment for each activity = part of hourly cost of labour *business leverage for activity * number of users of activity * time for which activity is unavailable to standard * weight of time during which activity was unavailable
Staff Satisfaction Overall satisfaction of users and managers with service provided by Help Desk and on-site support staff. Measured by an on-line survey sent to 10% of staff, immediately after they have made use of these services. Includes six monthly survey to determine why such services are not used.	
Acceptable (median rating over items is 6/7)	Unacceptable (rating less than 6/7)
Extend the contract by three months for every three months where this rating is maintained	Provider to take remedial action at no further cost

basis for the resistance is inertia, because of the effort of having to make changes, the worries of the unknown, and suspicions between the parties that the other would gain an unforeseen advantage.

We have learnt that business managers, in this agency at least, are very keen to see “where their dollar goes”. They do want to know how well their staff are being supported by the IT systems. Accordingly, they are keen to see M2P work.

There is a tacit move towards selective sourcing [1] underway as well. The purchasing agency is beginning to see that it can do better with internal resources in some areas and so it is seeking to change the pricing regime and Service Level Agreement to reflect this move.

VI. CONCLUSION

The Measure to Manage Performance method for measuring performance under contract is based upon measurement principles derived from experience and the assessment/ evaluation literature. It does supply a unique and powerful method for measuring - and so enhancing - the “business-based” performance in demand now.

REFERENCES

- Mary Lacity and R. Hirschheim, “Beyond the Information Systems Outsourcing Wagon”. John Wiley: Chichester, 1995
- L. Willcocks and Mary Lacity, “IT outsourcing in insurance services: risk, creative contracting and business advantage”, *Information Systems Journal*, 1999, 9, 163 - 180
- S. Hawkins, “Developing Service-Level Agreements, Part 1”, Research Note KA-OUT-201, GartnerGroup, 11 November 1996
- Anne Caine, “Negotiating an Effective Service Level Agreement”, www.nswscl.org.au, last access 10 November, 1998
- V. Grover, M. Cheon, and J. Tend, “The Effects of Service Quality and Partnership on the Outsourcing of Information Systems Functions”, *Journal of Management Information Systems*, 1996, 12 (4), 89 - 116
- G. Wright, “Perspectives on Performance Measurement Conflicts in Service Businesses”, *Journal of General Management*, 1998, 23 (4), 35 - 50
- Jeanne Ross, M. Vitale, and Cynthia Beath, “The Untapped Potential of IT Chargeback”, *MIS Quarterly*, 1999, 23 (2), 215 - 237
- W. deLone and E. McLean, “Assessing the Business Value of Information Systems”, lattanze.loyola.edu/fpapers.html, WP0493.017.html, prepared 1993, last access 11 November, 1999
- D. Fink and Falantina Tarka, “Measuring Information Systems Effectiveness: The Emergence of Business Performance Framework”, Proceeding of the Fifth Australian Conference on Information Systems, Monash: Melbourne, 27 - 29 September, 1994, 687
- P. Seddon, M. Bowtell, R. Patnayakuni, and D. Staples, “The IS Effectiveness Matrix: a Taxonomy of IS Effectiveness Measures”, www.dis.unimelb.edu.au/staff/peter/SEffectivenessmatrix.html, prepared 1997, last access 14 September, 1999
- R. Kaplan and D. Norton, *The Balanced Scorecard: Translating Strategy into Action*, Harvard Business School Press, Boston: Mass, 1996
- L. Willcocks, *Developing the IT Scorecard*, Seminar presented to the Australian Graduate School of Management, UNSW, Sydney, Australia, 21 October 1998
- General Services Administration, “Chapter 4. Developing IT Performance Goals and Measures”, www.gsa.gov/gsacio/cap4.htm, last access 14 September, 1999
- B. Myers, Kappelman, and V. Prybutok, “A Comprehensive Model for Assessing the Quality and Productivity of the Information Systems Function: Toward a Contingency Theory for Information Systems Assessment”, www.year2000.unt.edu/kappelma/framisrc.htm, prepared 1997, last access 14 April, 1999
- Australian National Audit Office, *Better Practice Principles for Performance Information*, www.anao.gov.au/bpgs.html, prepared 1998, last access 11 November, 1999
- Centre for Business Performance, Cambridge University, www-mmd.eng.cam.ac.uk/cbp/perfmeas.htm, last access 11 November, 1999
- Measure.net, Ann Arbor: Michigan, measure.net/resource/sites.htm, last access 11 November, 1999
- L. Willcocks and Stephanie Lester, *Beyond the IT Productivity Paradox*, John Wiley: Chichester, 1999
- P. Bendor-Samuel, “Redefining Outsourcing: The Value Model”, White paper, Everest, www.outsourcing-mgmt.com/html/redefining-internal.html, last access 18 September, 1999
- E. Lewis and C. Newton, *The Use of the Groupware in Preparing Information Management Plans*. paper presented at INFORMS 95, Singapore, 24 - 28 Jun
- Lisa Wargo, “Assessing the value in value-based pricing”, *Datamation Online*, www.datamation.com/servc/9906price2.html, last access 4 November, 1999
- Her Majesty’s Treasury Task for for Private Finance Initiative, www.treasury-projects-taskforce.gov.uk/, last access 11 November, 1999
- Anne Rouse and X. Jiang-Xiang, “Development of SOFTQUAL: A Scale to Measure the Service Quality of Software package Vendors”, Proceedings of the Eighth Australian Conference on Information Systems, 1997, 1 - 12
- A. Parasuraman, L. Berry, and V. Zeithaml, “Perceived Service Quality as a Customer-based Performance Measure: An Empirical Examination of Organizational Barriers using an Extended Service Quality Model”, *Human Resource Management*, 1991, 30(3), 335 - 364