Peer review

Use of the Conjoint Value Hierarchy approach to measure the value of the National Continence Management Strategy

Abstract

The evaluation of the Australian Government’s National Continence Management Strategy (NCMS) has incorporated a multi-pronged approach to measuring the success of the programme. One of the approaches, Conjoint Value Hierarchy (CVH) analysis, provided a measurement of value delivered by the NCMS from the perspective of stakeholders. CVH is derived from a number of approaches and is underpinned by measurement theory, a branch of applied mathematics.

This paper does not attempt to present the more theoretical aspects of CVH, but focuses on its application and results with respect to the NCMS. The broad results identified that more than half (55%) of the value of the NCMS is generated through outcomes and their delivery. The development of academic and human infrastructure accounted for a further 37% of value. The reputation and image of the NCMS provided the remaining 8% of overall value.

CVH analysis has highlighted the areas of greatest potential value gain for the NCMS and the areas of greatest potential loss. This has identified the need for a careful and balanced approach when considering any change in emphasis of the NCMS, thereby informing programme planning and implementation.

Keywords: value, National Continence Management Strategy, Conjoint Value Hierarchy, stakeholder, performance measurement

Introduction

The National Continence Management Strategy (NCMS) is an Australian Government-funded initiative, established in 1998, to undertake research and service development projects aimed at the improvement of continence awareness, management and treatment, so that more Australians can live and participate in their community with confidence and dignity.

For the management of a programme to be effective it needs to be measured. It is important, however, to measure more than just outputs and performance. Government agencies are increasingly required to measure the social value outcomes of their programmes. At the same time, there is a greater level of complexity associated with value creation in these programmes than in profit-generating organisations. Bureaucratic and budgetary constraints of government programmes often result in trade-offs between the needs of different stakeholders.

An independent evaluation provided evaluation advice to the Australian Government’s Department of Health and Ageing on the NCMS and its projects. This process utilised an evaluation framework that integrated several complementary methodologies, all with a central focus on informing programme improvement and determining the success of the NCMS. One of these methodologies, Conjoint Value Hierarchy (CVH), involved a process which allowed an understanding of the value creation potential of the work undertaken.
CVH has proven applicability and has been used with success in the assessment of value in commercial and government applications both within Australia and internationally. Its use, however, to measure the value of health-related initiatives is innovative.

A CVH was developed for the NCMS by Intellectual Capital Services in 2006 and the first CVH survey was undertaken at that time. A second stakeholder survey was undertaken by the NCMS evaluators in 2008. This paper provides a summary of the results from the 2008 survey.

**CVH methodology**

The use of CVH provides an understanding of how programme components interrelate to create value. To achieve this, CVH uses a structure that maps the value of the entity (in this case, the NCMS) and then overlays a numerical system in order to provide mathematically-based results. This allows transference of the intangible value attributes to an arithmetical structure that can be analysed through standard mathematical procedures.

**Measuring values**

Axiology, or value theory, is the study of values and value judgements. According to Hartman, an original proponent of axiology, the value of a thing “is the set of properties which defines the thing.” To arrive at a measurement of values requires defining the many components contributing to value and converting these into objective characteristics, properties, or attributes. Measurement becomes possible once a clear understanding is reached of what the object or entity is and what is to be measured.

The difference between value and performance is that performance is a numerical measure that doesn’t reflect whether that performance is valued. The use of CVH analysis combines value measurement and performance measurement to determine whether the performance is worth having.

**Stakeholder involvement**

The CVH process relies on a participant-oriented approach that ensures that stakeholders’ views and value-based judgements are incorporated during the construction of the hierarchy and assignment of value attributes. Participatory approaches empower stakeholders and help to improve programme implementation and relevancy by actively engaging stakeholders in the process. Stakeholders involved in the CVH process should have the knowledge and experience to make judgements about the value and performance of the programme being analysed and each stakeholder needs to be accountable for the integrity of their respective position.

**Applying the CVH to the NCMS**

The first step in applying the CVH process to the NCMS was to define the scope of the work; that is the precise definition of what was to be measured. At the outset, it was determined that efforts to measure value would be best directed at the NCMS programme level rather than governmental policy on incontinence or the operational aspects at individual project level.

The next step was to engage stakeholders with knowledge and experience to make judgements about the NCMS and its performance. This was achieved through a workshop held with 25 representatives of the following key stakeholder groups:

- Continence Management Advisory Committee (the advisory body for the NCMS).
- Government departments (federal and state), including Department of Health and Ageing (DoHA), Department of Human Services Victoria and Department of Veterans’ Affairs (DVA).
- Industry representatives, including InTouch and Tycohealth.
- Relevant peak bodies, including the Continence Foundation of Australia, the CFA State Resources Centres, the Prostate Cancer Foundation of Australia, Carers Australia, Aged and Community Services Australia, Australian Federation of Disability Organisations, and Aged Care Association Australia.
- Health professionals, including medical specialists (urology, urogynaecology, gerontology), GPs, continence nurses, physiotherapists and pharmacists.
- Representation from health professional bodies, including Australian Physiotherapy Association, The Pharmacy Guild of Australia, Division of General Practice, and National Nurses for Continence.
- The university sector, including researchers and educators, Australian Health Outcomes Collaboration, and the Research Centre for Gender, Health and Ageing.
- The NCMS Independent Evaluation Team.
- Consumers, including those with a disability and continence issues, those caring for someone with continence issues, and those at risk of developing continence issues.

Participants were mostly selected on the basis of their involvement in the work of the NCMS from either an advisory or implementation capacity. They each represented one or more of the key groups deemed important to programme planning and management. Each stakeholder participant had, to some
degree, a limited view of the NCMS but collectively the group ensured that everything of importance to the key stakeholder groups was included. A CVH principle that was followed was that all stakeholders had equal importance and no stakeholder had the right to object to another’s opinions.

The third step was to develop the hierarchy from participant information about the key attributes that drive value in the NCMS (Figure 1). All opinions from all 25 stakeholders were combined and attributes at all levels were tested for uniqueness of meaning.

The principal limitation associated with measuring value relates to difficulties with measuring some of the attributes identified by stakeholders. As a consequence, the CVH approach involved continued breakdown of the value structure until a point was reached where it was believed that most of the attributes could be measured directly or that there was a reasonable proxy. Each proxy measure was tested to ensure that the meaning of the attribute on the level above in the hierarchy was not changed by the substitution of the proxy.

The next step was to obtain individual stakeholder views about value preferences and performance results for each of the value attributes. Surveys were conducted either via face-to-face interview or self-completed questionnaire. Due to logistical constraints, 13 stakeholders were surveyed via face-to-face interview. The remaining 12 stakeholders were invited to complete the questionnaire electronically. Of these, four returned the questionnaire, thus providing a total of 17 survey participants. The participant group included representatives from all key stakeholder groups identified above.

The questionnaire consisted of four parts (Table 1). The data from each questionnaire reflected the individual values put forward by the stakeholder involved. The data was input to a series of algorithms within a Microsoft Excel™ file, resulting in 17 structurally identical but internally distinct mathematical measurement combinations.

Outputs were available for each individual stakeholder. The results were then combined to provide averages, across all participants, for use in reporting and longitudinal comparison.

Figure 1. NCMS value hierarchy.
The data outputs included:

• an understanding of the importance between the key branches in the value structure

• identification of the relative importance of the individual attributes

• identification of the sensitivity of the value perception of each stakeholder to changes in performance.

Findings

CVH analysis of the NCMS provided an assessment of what is important in the NCMS and a measurement of:

• the value attributed to the programme by the stakeholder representatives

• the relative importance of the attributes of value

• stakeholders’ perception of performance to date.

The broad results showed that there was a general consensus that outcomes and their delivery were most important, with more than half (55%) of the value generated by these. Capability generation or the development of academic and human infrastructure was slightly less important, accounting for a further 37% of value in the NCMS. The reputation and image of the NCMS provided the remaining 8% of overall value.

Relative importance of the attributes

Figure 2 depicts the level of importance the surveyed stakeholders placed on the identified value attributes in descending order, with the most valued element given a score of 100. The ‘outcomes and delivery’-related or instrumental value attributes (green bars) dominated the upper level of the scale of importance. This means that the stakeholders believed that the attributes that delivered outcomes to the consumer community were of greatest importance. A programme that works towards promoting Specialist health professionals using best practice in the area of incontinence, a ‘capability’-related attribute, was the exception and was rated by the stakeholders as the third most important attribute of value in the NCMS.

The remaining attributes in this category (blue bars) dominated the mid-range and reflected the need for tangible resources such as trained people, facilities and intellectual capabilities. Image-related attributes (yellow bars) were not viewed as a major focus in achieving high value in the NCMS. This pattern indicated that the value attributes were well aligned with the aims of

![Figure 2. The average value creating potential of the value attributes on a scale of 0–100.](image-url)
Table 1. CVH questionnaire components.

<table>
<thead>
<tr>
<th>CHV questionnaire component</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relative importance</td>
<td>Ranking of the relative importance of each branch and attribute with the most important used as a fixed point.</td>
</tr>
<tr>
<td>Value/performance relationship</td>
<td>Assessment of the stakeholder’s perception of the relationship between performance and value for each of the attributes.</td>
</tr>
<tr>
<td>Combination settings (pairing effect)</td>
<td>Assessment of the relationship between performance of each of the attributes in a pair/group and how that would affect the value of the whole group of attributes.</td>
</tr>
<tr>
<td>Performance data</td>
<td>Subjective assessment of NCMS performance per attribute on a scale of 0–10 where 0 represented the threshold of uselessness and 10 equated to the best performance one could reasonably expect.</td>
</tr>
</tbody>
</table>

the NCMS, which may be summed up as making a practical difference to continence management in Australia.

**Potential for loss and gain**

The CVH methodology enabled ‘what if’ modelling to predict the impact of increases or decreases in performance on the value of the NCMS. To achieve this, the stakeholder perceived performance data was analysed against ranked importance data to determine which attributes would generate the greatest change in value as a result of changes in performance. Figure 3 provides an indication of the relative beneficial gain in value of the NCMS if the performance of an attribute were to be increased by 10% (right side of graph in descending order – yellow/blue bars). A potential 10% decrease in performance identified a number of areas where the value would suffer to varying degrees (left side of graph – yellow/red bars – not in order).
Conclusion

CVH combines the use of an axiological approach with multi-attribute value theory and measurement theory to measure value for the purpose of decision-making. Although the measurement of value in an entity that is largely intangible is difficult, use of a research methodology such as CVH has allowed realistic assessment of the components of the NCMS. This provided a description of what is important in the NCMS through measurements of value, importance and performance.

Through clarification of the areas of importance to key stakeholders, CVH helped to establish and review the priorities for work to be undertaken for Phase 3 (2006–2010) of the NCMS. The value attributes have also provided a number of the measures used for project and programme level evaluation. This provided an ongoing link between what is important to stakeholders and measurement of performance and outcomes.

The use of CVH within the overall evaluation framework for the NCMS has highlighted a number of important potential benefits of CVH within the NCMS and beyond:

1. The first lies with the scope of CVH to capture stakeholder values and incorporate their measurement into the overall evaluation of the programme.
Table 2. Value gain/loss potential with performance change (top five attributes).

<table>
<thead>
<tr>
<th>Attributes with greatest potential for gain with performance improvement</th>
<th>Attributes with greatest potential for loss with performance loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-management</td>
<td>Numbers attending courses which include continence issues</td>
</tr>
<tr>
<td>Public understanding</td>
<td>Self-management</td>
</tr>
<tr>
<td>Awareness of best practice</td>
<td>Level of treatments</td>
</tr>
<tr>
<td>Level of treatments</td>
<td>Specialist health professionals using best practice</td>
</tr>
<tr>
<td>Specialist health professionals using best practice</td>
<td>Successful outcomes</td>
</tr>
</tbody>
</table>

2. The second is the capacity for CVH to signal consequences (positive or negative) of future programme implementation.

3. The third is the potential for the use of CVH to develop and enhance the evaluation of the NCMS and other long-term programmes.

Further information

* Göran Roos, Chairman of Intellectual Capital Services, London, is one of the founders of modern Intellectual Capital (IC) science. As a recognised world expert in the field of IC, he has developed theories and implemented practical solutions in this field. He is a visiting Professor of Intangible Asset Management and Performance Measurement at the Centre for Business Performance, Cranfield University, UK, visiting Lecturing Professor in Intangible Asset Management and Knowledge Management at the Helsinki School of Economics and visiting IC Adjunct at Mt Eliza Business School, Melbourne, VIC.

References