Calculating Customer Lifetime Value (CLV): Theory and Practice

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Abstract

This paper examines the calculation of customer lifetime value (CLV). Two case studies from Australasian practice are used to describe how CLV is calculated. These case studies reveal that customer retention rates, customer acquisition costs and the present value of future expected base profits are incorporated into the calculation of CLV. Other drivers of CLV, such as revenue growth, cost savings, referrals and price premiums, were not significant in this examination of practice. Practitioners indicated that these other drivers were not used for two reasons: first, they were unable to readily quantify them; and second, they expressed doubts as to their significance. In brief, it appears that practitioners are developing simple and feasible representations of CLV to use in business decision-making.
1 Introduction

Customer loyalty is a topical business issue. Many firms are incorporating loyalty programs into their strategic and marketing plans (for example, American Express, Visa, Qantas and Lexus). Given the level of resources that are required by such programs, what is enticing these firms to jump onto the 'loyalty bandwagon'? The incentive to implement customer loyalty programs is driven by claims of dramatic improvements in profitability and growth. Such claims include the following:

- An increase in customer retention rates by as little as 5% has the potential to increase profits (via improvements in the net present value of a customer base) by up to 100% (Reichheld/Sasser 1990);
- Firms can spend up to five times more obtaining a new customer than retaining an existing one. Retaining loyal customers reduces the cost profile of a firm (Henry 1994);
- Further profitable benefits can be obtained by focusing retention strategies on a firm's most profitable customers. Commonly, 80% of a firm's profits are derived from 20% of customers only (Taufert 1996; Berry/Britney 1996; Costanzo 1995; Peppers/Rogers 1997; Pearson 1996); and
- An understanding of loyalty enables cost-effective strategies to be designed for re-gaining and re-establishing relationships with valuable customers who have defected (Stauss 1997).

To assess the financial benefits of customer loyalty programs, it is necessary to calculate the value generated from such schemes. Two main methods may be used: customer profitability analysis or customer lifetime value (CLV). Customer profitability analysis (Smith/Dikolli 1995; Bellis-Jones 1992) traces historical costs and revenues to particular customers or segments using an accounting technique called activity-based analysis (Atkinson et al. 1996; Horngren et al. 1997). Customer lifetime value, in contrast, attempts to look forward. It estimates the net present value of current and future cash flows driven by a particular customer or segment. It is argued that CLV is more decision-relevant because it takes into account factors that may affect the future profitability of a customer or segment, rather than concentrating solely on past performance. Despite this relevance, there is no empirical research within the accounting literature on CLV. The marketing literature, whilst recognising the conceptual importance of CLV, contains little or no sustained discussion and illustration of its practice. It is the purpose of this paper, therefore, to examine how CLV is calculated in practice.

The remainder of the paper is structured in the following way. Section Two outlines the conceptual model of CLV advanced by Reichheld (1993, 1996). Section Three outlines literature proposing how CLV may be used in particular business settings. Section Four describes how CLV has been calculated in two case studies of Australasian practice. Sec-
tion Five contains a discussion of the main issues. Future directions for research are outlined in Section Six and Section Seven concludes the paper.

2 The Concept of CLV

The conceptual literature on CLV is dominated by the work of Reichheld (1993, 1996). Reichheld argues that CLV is driven by two main effects: a customer volume effect and a profit per customer effect. The customer volume effect argues that the lower a firm’s customer defection rate, the faster it will grow. Reichheld (1996) uses the analogy of a ‘leaky bucket’:

"Imagine two companies, one with a customer retention rate of 95 percent, the other with a rate of 90 percent. The leak in the first firm’s customer bucket is 5 percent per year, and the second firm’s leak is twice as large, 10 percent per year. If both companies acquire new customers at the rate of 10 percent per year, the first will have a 5 percent net growth in customer inventory per year, while the other will have none. Over fourteen years, the first firm will double in size, but the second will have no real growth at all. Other things being equal, a 5-percentage-point advantage in customer retention translates into a growth advantage equal to a doubling of customer inventory every fourteen years. An advantage of ten percentage points accelerates the doubling to seven years" (p.37).

Reichheld (1993, 1996) theorises the profit per customer effect in terms of six variables, outlined below (see Figure 1).
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Figure 1: Components of the Profit per Customer Effect

- Acquisition costs. The costs of acquiring new customers leads to an expectation of lower levels of profitability, or even losses, in the early stages of a customer relationship.

- Base profits. Profits will be earned from customers’ purchases, unaffected by factors such as time, loyalty and efficiency, over the period of a customer relationship.

- Revenue growth. Customer spending accelerates as the relationship between a customer and a firm matures, resulting in increased profits from a more expansive purchasing pattern.

- Cost savings. Operating costs are reduced over time as both customers and the firm become more knowledgeable and efficient in their relationship. This results in cost savings from reduced service time and support.

- Customer referrals. Loyal customers, because of their satisfaction and emotional attachment to a firm, refer other potential customers to a firm.

- Price premiums. Loyal customers are seen to be less price sensitive, valuing an established business relationship over discounted prices being offered by competitors with less knowledge of their needs and activities.

In this model, CLV is calculated by discounting future expected cash flows derived from a firm’s customer base to arrive at a present value.
3 Applying CLV To Specific Business Contexts

This section considers four models from the extant literature that illustrate how CLV may be applied to particular business settings (Gloy et al. 1997; Keane/Wang 1995; Pritchard 1991; Jackson 1989a, 1989b, 1989c). Each of these proposed models is outlined and compared to Reichheld’s model.

Gloy et al. (1997) consider CLV in the context of the agricultural input sector. In their paper, they argue that CLV may be calculated by: first, identifying a number of relevant customer segments; second, assessing the current and projected profitability of these segments; and third, discounting projected profitability to estimate CLV (see Figure 2 below).

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Figure 2: Calculating CLV in the Agricultural Input Sector
(See Gloy et al. 1997)
Whilst there is some consistency between Gloy et al.'s and Reichheld's model, it is limited. Retention rates have been considered and thereby address the customer volume effect. Acquisition costs are also included, as are base profits (revenues less costs). However, there is no explicit incorporation of the other profit per customer factors posited by Reichheld.

Keane and Wang (1995) discuss CLV in the context of the newspaper publishing industry. They portray CLV as the difference between net income and acquisition costs for each of the years analysed. The customer base was segmented according to circulation zones (see Figure 3 below).

Figure 3: Calculating CLV in Newspaper Publishing
(see Keane/Wang, 1995)

A number of similarities to, and departures from Reichheld’s model are again noted. The customer volume effect is considered in terms of ‘churning’ and its impact on the frequency of acquisition costs. With respect to the profit per customer effect, both acquisition costs and base profit are considered. However, any subsequent changes in revenue and costs over time are considered through the effects of inflation only.
Pritchard (1991) examines the calculation of CLV in associations. According to Pritchard, the main components used in the calculation of CLV are the average membership period and the costs and revenues linked with the acquisition and retention of members (see Figure 4 below).

![Figure 4: Calculating CLV in Associations](see Pritchard 1991)

Again, there is only a partial correspondence between Reichheld's model and Pritchard's account. In Pritchard's article there is no discounting of future profits to arrive at a measure of CLV. Also the profit per customer effect is limited to a consideration of acquisition costs and base profits only.

Jackson (1989a, 1989b, 1989c) discusses the application of CLV to the insurance sector. Jackson identifies a number of factors that may be incorporated into the calculation of CLV. These include: collected premiums; claims made; administration costs; total marketing costs (which is treated as an acquisition cost); premium taxes; contributions to reserves for future claims; and interest income derived from a timing difference between the collection and payment of fees. These revenue and expense items are to be determined over a 10 year period and discounted back to a present value (see Figure 5 below).
Once again, there is a divergence between the theory of Reichheld and the approach outlined by Jackson. Whilst consideration is given to the impact of defections, it is not explained how this is taken into account (although the figures presented suggest that its impact is related to the level of premium collected each year). Since all the costs and other revenues have been calculated as a percentage of collected premium, and there is no explanation as to how the collected premium is derived, it is difficult to determine which profit per customer factors have been considered - other than acquisition costs and base profits.

![Diagram of Calculating CLV in the Insurance Sector](image)

**Figure 5**: Calculating CLV in the Insurance Sector
(see Jackson 1989a, 1989b, 1989c)

Overall, when compared to the work of Reichheld, the above literature indicates that less complex models of CLV may be implemented for use in practice.

## 4 Australasian Practice: Two Case Studies

This section describes how CLV is calculated in two Australasian organisations, referred to as Health Ltd and AustInsure Ltd. [1] Health Ltd is an established firm in the health insurance sector and AustInsure Ltd is one of Australasia's top 10 general insurers. The data were collected in 1997 using semi-structured interviews (Kidder/Judd 1986).
4.1 Case One: Calculating CLV in Health Ltd

Figure 6 (see below) illustrates the general process of calculating CLV in Health Ltd.

Overall, the customer base was segmented into 5-year age bands. For each of these age bands, an average annual contribution was calculated based on the previous three year’s data. An average contribution per member for each age segment was calculated. First, an individual’s claims per year were subtracted from the average premium attributed to that member for the year. Next these individual contributions were aggregated and averaged to derive the average member contribution for an age segment. To calculate CLV, the average remaining tenure of customers belonging to each of the age bands was then estimated. The last step in calculating CLV involved discounting annual contributions for an age band over the average remaining tenure for that age band. [2]

More specifically, the interviews at Health Ltd revealed that:

- Acquisition costs were incorporated into the annual contribution calculation.
- Base profits were embedded in the calculation of the annual contribution margin for a member over the lifetime of their relationship with the firm. The annual contribution was calculated as Premiums Revenue less Claims. Other operating costs were not considered in the lifetime valuation analysis as they were relatively small.
- Revenue growth was incorporated into CLV in a de-facto fashion, via the derivation of an annual contribution. Health insurance premiums increase with time as individuals move to higher levels of coverage.
- Cost savings were not incorporated into the CLV calculation. The information system capabilities of Health Ltd did not permit this kind of cost assignment and analysis.
- Referrals were not included in the calculations. First, Health Ltd did not capture this type of data. Second, 50% of Health Ltd’s customers were corporate customers and referrals were not considered to be relevant at this level.
- Price premiums were not included.
4.2 Case Two: Calculating CLV in AustInsure Ltd

The process of calculating CLV in AustInsure Ltd is described in the context of a motor vehicle insurance product (see Figure 7 below).
The data to calculate CLV were derived from existing customer data; including the average premium, loss ratio, commission ratio, defection rate and average branch expenses (for new and renewal policies, as well as average claims expenses). These averages were determined by analysing data from the previous 10 years. The resulting figures were netted off to calculate an annual underwriting contribution for each year of a customer’s estimated life. This annual contribution was then discounted back to a present value and multiplied by the proportion of members retained by AustInsure each year. The figure derived for each year was then summed to arrive at the net present value for a customer segment.

The segmentation variables that AustInsure utilised varied according to the type of product that was being analysed. With respect to the motor vehicle insurance product being illustrated, the key segmentation variables were a member’s age, tenure, and driving record. These segmentation variables were utilised because it had been shown that older
members, who had been with AustInsure longer and had less accidents, represented a category of customer that was significantly more valuable than the rest.

As with the previous case, the calculation of CLV is considered against the framework of Reichheld's model. The interviews at AustInsure revealed that:

- Acquisition costs involved setting up a new customer profile and these costs were measured and included in branch costs.
- Base profits were included in the CLV analysis but were assumed to be constant over the lifetime of a customer relationship.
- Revenue growth was considered implicitly in the calculation of CLV. It was recognised that the longer a customer stayed with AustInsure, the deeper and more profitable a relationship became.
- Cost savings were not included in the analysis but it was acknowledged that loyal customers required less resources and support.
- Referrals were not included in the calculation of CLV. AustInsure had no way of measuring this. Interviewees described referrals as "a little bit of cream", rather than a significant factor driving profitability.
- Price premiums were not included in the calculation of CLV. Indeed, price premiums were considered to be at odds with increasing customer retention in the Australasian insurance industry (which is very price competitive).

5 Discussion

The insights of the extant literature and these two case studies of Australasian practice indicate that the calculation of CLV is informed by three main drivers: first, customer retention rates; second, customer acquisition costs; and third, base profits. It is the quantification and combination of these three drivers that provides information that is considered both useful and sufficient for the task of assessing the economic benefits of customer loyalty programs. These exemplars also indicate that discounting methodologies are being used to calculate CLV. As such, firms are focusing on the anticipated benefits of customer loyalty; they are not engaged in retrospective analyses only. In summary, a relatively simple model of CLV has emerged in practice. Practitioners are developing feasible approaches to the calculation of CLV within prevailing organisational constraints.

It should be noted that extant practice is also characterised by a less encompassing quantification of acquisition costs and base profits than is suggested by Reichheld's work. In practice, not all information relevant to either acquisition costs or base profits is quanti-
fied for the purposes of calculating CLV. It should be noted, however, that practitioners interviewed in the two case studies of Australasian practice were aware of this. They would have preferred more accurate and complete information. However, they faced difficulties obtaining it. In particular, they confronted problems with the design of their management information systems and related databases. These organisations did not have integrated information systems. Without such integration, it is very difficult for data to be extracted from a variety of systems and combined for the purpose of calculating CLV. Also, information systems have been dominated by the idea that the product is the primary focus of business decision-making. This makes it difficult to obtain information relating to revenues and costs that are driven by customer-specific characteristics.

This simplified approach to the calculation of CLV in practice has effectively excluded a range of drivers highlighted as being important in the work of Reichheld. More particularly, revenue growth, cost savings, referrals, and price premiums have little or no place in the working models of practitioners. Why may this be the case? In the case of revenue growth there appears to be practical reasons for the explicit exclusion of this driver from CLV calculations. The sales histories of customers across product groups, and sometimes even within product groups, are not routinely captured by information systems in a way that makes customer data readily available for such analysis. In the case of cost savings, the reduction in resources consumed by more loyal and knowledgeable customers is not recorded by accounting systems (although special studies may be instituted for this purpose). The driver referrals was also absent in practical representations of CLV. Again, such information is not routinely recorded by firms’ information systems, although there is a possibility that this loyalty effect is already built into the retention rate calculations underlying this more simplified model of practice. Finally, price premiums were likewise absent in practitioner models of CLV. They expressed cynicism with respect to the relevance of this driver. A view was expressed that improvements in customer retention rates were achieved by conferring greater value on customers – and this resulted in downward pressures on price (or the creation of a ‘negative price premium’).

6 Future Research

The emergent practice of CLV offers an interesting platform for future research. One potential strand of research involves an examination of the ways in which CLV impacts upon business strategies and decisions. How does information on CLV change the ways in which resources are used and deployed within organisations? Does the formulation of customer re-gain strategies or the management of customer relationships change as a consequence? A second strand of future research could map the ways in which the practice of CLV is informed by a changing business environment. For example, as more firms successfully implement and operate fully integrated information systems, will we witness greater complexity in the quantification of CLV? As information becomes more readily
available through data-mining expertise, will the calculation of CLV more closely resemble the theoretical representations of Reichheld? Moreover, will the increasing complexity and comprehensiveness of calculative regimes translate into improved resource management practices within firms? Third, there are also opportunities to examine the construction of customer loyalty and the value that is gained over the lifetime of a relationship from the perspective of a customer. How are customers interpreting and responding to the ways in which product/service offerings are delivered and managed by particular firms? An understanding of this from customers’ rather than managers’ perspectives, would provide a more nuanced and balanced understanding of CLV in action. Fourth, there are also opportunities for research in this area which critically appraises the social consequences of commodifying important organisational relationships, such as those with customers, in terms of financial outcomes that need to be ‘managed’ and ‘optimised’. What happens to those customers who are less valuable to organisations, especially in the context of basic services such as banking and health care?

7 Conclusions

This paper has been concerned with the calculation of CLV. The extant literature and two case studies from Australasian practice were used to typify this. In practice, measures of CLV encompassed customer retention rates, customer acquisition costs and the present value of future expected base profits. Other drivers of CLV, such as revenue growth, cost savings, referrals and price premiums, were not significant in the situations outlined. In conclusion, we argue that practitioners are developing feasible, simple and effective ways of addressing the benefits and costs gained from customer relationship management. It is also contended, however, that improvements in management information systems may allow greater precision and more relevant information to be accommodated in the calculation of CLV in the future.

Notes


[2] The weighted average cost of capital was used to discount these cash flows.
References


