Measuring and Managing Customer Lifetime Value:

A CLV Scorecard and Cohort Analysis in a Subscription-based Enterprise

By Massimiliano Bonacchi, Ph.D., and Paolo Perego, Ph.D.

COMPANIES FREQUENTLY ENCOUNTER DIFFICULTY MEASURING CUSTOMER LIFETIME VALUE (CLV) AND CUSTOMER EQUITY (CE) BECAUSE OF THE LACK OF A PRACTICAL FRAMEWORK AND THE ANALYTICAL CHALLENGES BEHIND THE CLV PARADIGM. THIS ARTICLE PROPOSES STEP-BY-STEP GUIDELINES TO MEASURE AND MANAGE CLV IN A SUBSCRIPTION-BASED ENTERPRISE (SBE). A CASE STUDY DEMONSTRATES HOW A CLV SCORECARD AND COHORT ANALYSIS ARE PRACTICAL TOOLS THAT CAN SUPPORT DECISION MAKING.

The last few years, companies have increasingly turned to subscription-based models for offering services such as mobile telephones, cable television, software, and e-banking. The growth of the Internet and mobile devices has expanded the types of innovative services that are offered in a contractual setting (e.g., music, games, movies, and e-books) and has brought about a new wave of Web start-ups, including FriendFinder,

HomeAway, LinkedIn, Pandora, Skype, and Zynga.

In subscription-based enterprises (SBEs), a customer pays a fee to have access to the firm's products or services for a certain period of time. For an SBE to succeed, managers need to gain a more nuanced understanding of the strategic, financial, and operational implications of a subscription-based model. As highlighted by V. Kumar and Bharath Rajan, managers need performance measurement reports that are able to con-

vey information they can use to diagnose the health of their business and that can assist them in making strategic and tactical decisions such as:

◆ Which type of actual customer or future prospect should we retain, grow, or acquire?

◆ How much should be spent on various customer segments to retain, grow, acquire, or win back customers?

◆ Which advertising channels are most effective and efficient?

◆ What is the value of the customer base (i.e., the most important asset for this kind of company)?[1]

To address these issues, we refer to the notion of customer equity (CE), which is the sum of the customer lifetime value (CLV) across a firm's entire customer base. CLV can be enormously informative when calculated correctly, but most companies today calculate CLV improperly either because they do not connect the measure with its drivers or because they do not acknowledge customer lifetime heterogeneity.[2]

Academic and practitioner literature has repeatedly demonstrated the beneficial effects of a customer-centric strategy, but anecdotal evidence suggests that few companies practice such an approach in a systematic and effective manner. We believe one of the reasons is a lack of practical guidance. In this article, we attempt to fill this void by presenting a case study of a mobile content provider. We focus our attention on a CLV scorecard and cohort analysis—two tools that managers and management accountants in SBEs can use to gain a better understanding of the way they measure and manage customer profitability.

COMPANY BACKGROUND

Company.net (the firm's real name has been disguised for confidentiality purposes) is a typical example of a fast-growing SBE. A customer pays a subscription fee to receive a specified number of downloads of content, namely ringtones and music MP3s, to a mobile phone or device. Company.net works with all the major record labels, which supply content, and it has agreements with the most important phone carriers to deliver content to the network and bill customers through their mobile accounts. Customers are reached predominantly through paid search advertisements using keywords

such as "free ringtones" or "free music."[3] Figure 1 presents the industry value chain. It typically is characterized by the following activities: content origination, service management, marketing and display, network delivery, customer relationship management, and billing.

Company.net follows a common SBE business strategy: (1) acquire new customers through aggressive marketing techniques of customer acquisition aimed at building up a new user base; (2) retain existing customers by measuring the lifetime of users and their value with techniques that typically stimulate user retention and minimize churn rate; and (3) once the user base is built and the churn rate is under control, the focus shifts toward planning for the organic growth of the user base and defining the new client target acquisition number for each period (e.g., month or quarter) in order to balance churn rate and reach the target growth rate.

THE PERFORMANCE MEASUREMENT SYSTEM

A company's performance measurement system shapes, and is shaped by, its strategy.[4] At Company.net, the performance measurement system has been built around CLV and CE. CLV is the value of future cash flow/profit attributed to a single customer or a group of customers discounted using the company's average cost of capital. It is a forward-looking metric that drives customer profitability, particularly when a firm has to decide which customers to acquire (CLV is the upper bound of expenses that a firm should incur to acquire a customer), what customers to nurture (managers should focus on customers with high CLV), and the quantity of resources to allocate (marketing resources should be allocated so as to maximize CLV).[5] As stated previously, CE is the sum of CLV across all customers of a company, both existing customers and future customers. CE is the most important asset for an SBE, and it is influenced by the ability to acquire, retain, and increase the customer base. While several methods of computing CE have been suggested, we will focus on two metrics that can be used when evaluating the expected profitability of a company's customer base:

1. Current customer equity (CEcur), which is the sum of the future profit margins generated from

Figure 1: Entertainment Industry Value Chain of Company.net
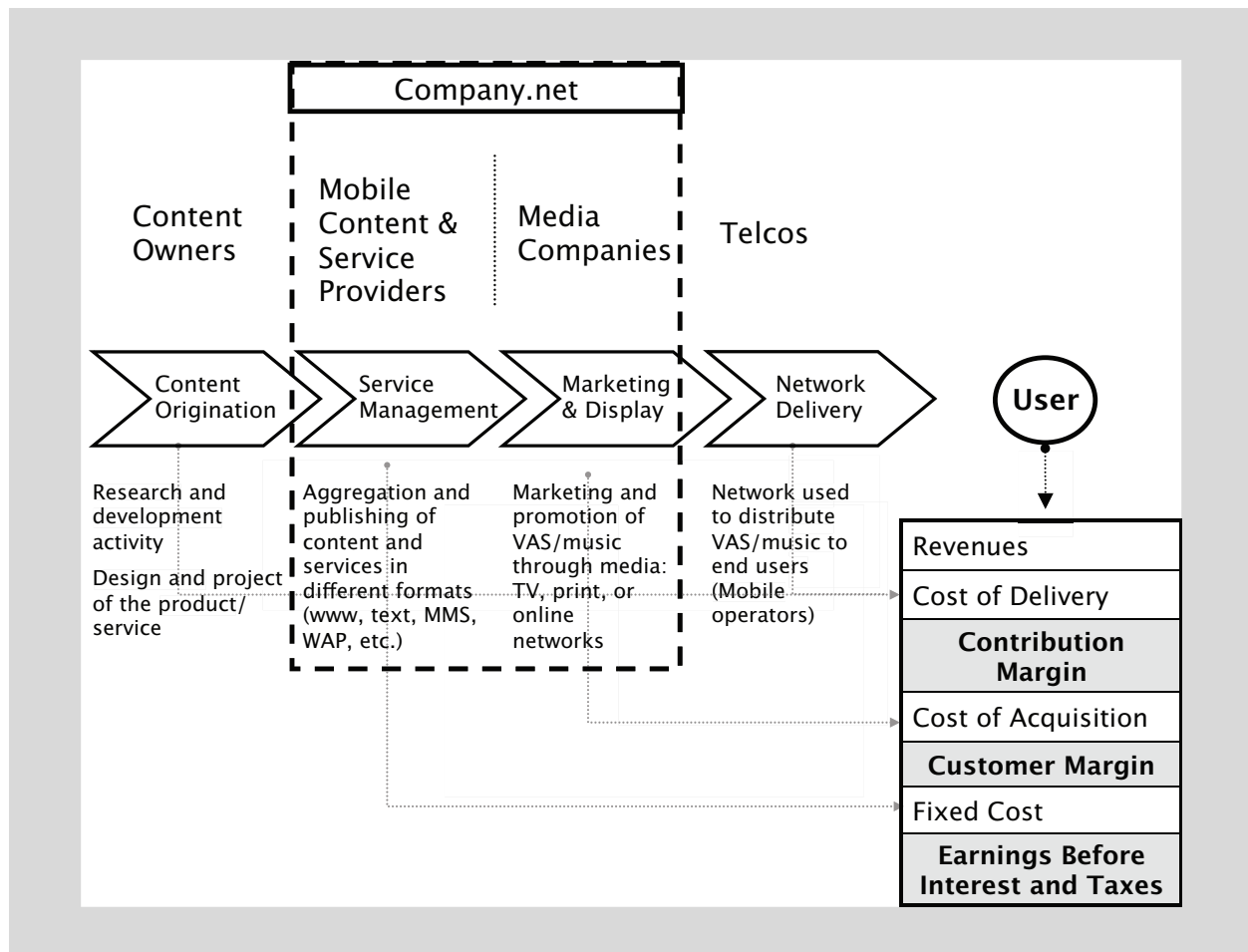
the customers who have already been acquired by the end of the period.[6]

2. Total customer equity (CEtot), which is the sum of the future profit margins generated from current (CEcur) and future (CEfut) customers of the firm.[7]

From a management accounting perspective, the challenge is not only to measure CLV—and thus CE as a summation of each customer's CLV—but also to manage its drivers. Looking at the relationships among these drivers is crucial because the variables of the CLV formula are interdependent. When a metric is pushed in one direction, it becomes more difficult to ensure that the other keeps the same pace. A managerial tool to consider the interaction among CLV and its drivers is the CLV scorecard.[8] Figure 2 shows the CLV scorecard Company.net used. As you can see, the two key CLV

drivers are cost of customer acquisition (CoA) and lifetime value (LTV).

Cost of Customer Acquisition (CoA)

CoA is a straightforward metric. In this setting, it can be estimated in a very precise way for every single customer. Company.net uses search engine advertising that measures cost per click and cost per acquisition metrics—as opposed to banner advertising (measured by a cost per impression model) or traditional channel advertising such as magazine and TV ads. Because CoA is influenced by the type of marketing policies, its analysis is the first step for managerial actions that will impact the company's attraction and conversion rate. In other words, it can lead to better targeting, better advertising, better landing pages, optimization of the flow through to checkout, more and better payment options, and so forth.

Figure 2: Customer Lifetime Value Scorecard at Company.net
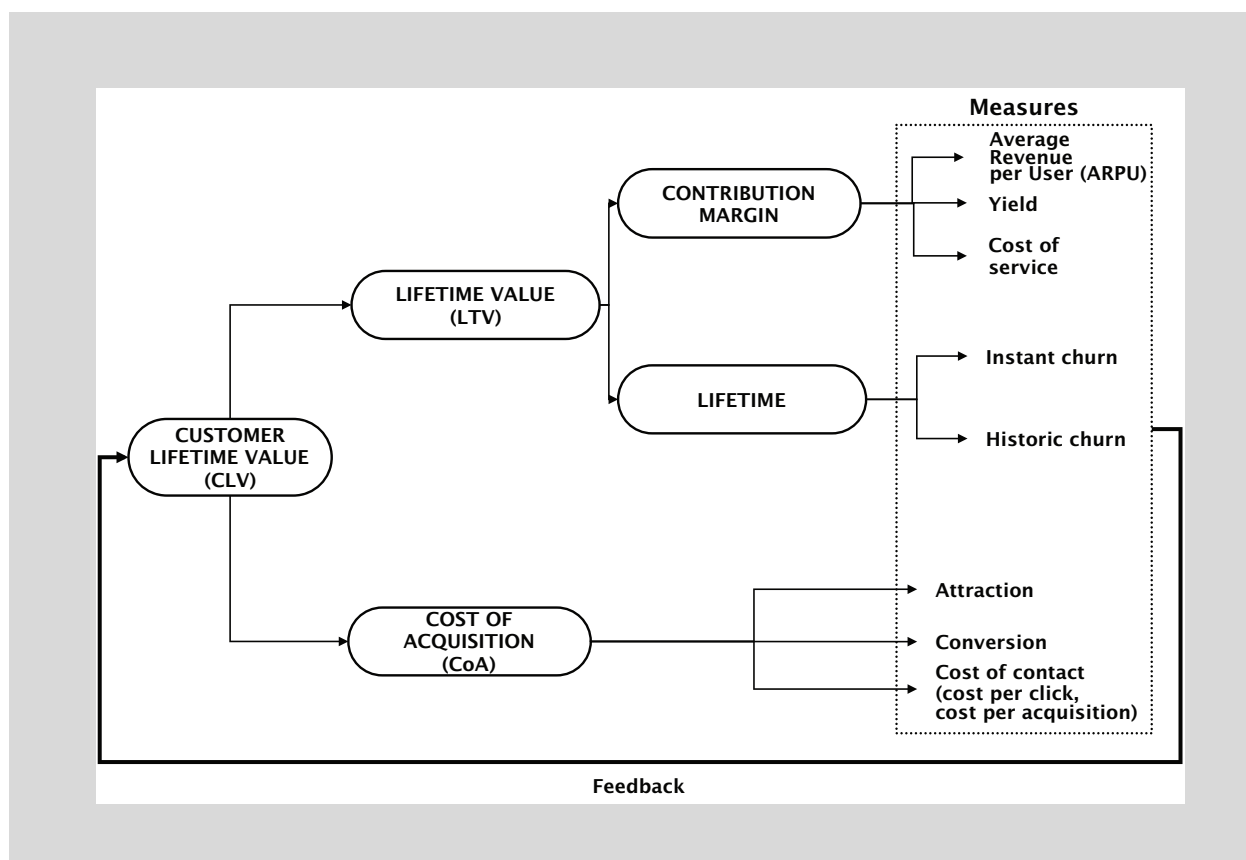
Lifetime Value (LTV)

Determining LTV requires a more sophisticated analysis of its main drivers, which are lifetime, margin, and yield. In order to manage LTV, a company needs to carefully examine the relationship between the metric and its drivers. This relationship can be synthetized by the equation:

Lifetime Value = Lifetime × Margin × Yield.[9]

Lifetime is the period during which a customer stays with the company. This metric is a function of the rate of attrition (cancellations/average users per period) over a period of time that subscription-based customers "churn out" (unsubscribe) from the customer base. Churn is a proxy of the customer satisfaction of the service. The underlying rationale is that there is a fairly simple relationship between churn per month and the number of months that customers stay with the company—in other words, a ratio of 1/churn. Thus, a 2% churn means 1/0.02, or an average customer duration of 50 months. To get a good grasp of churn,

Company.net uses two approaches:

1. **Historic churn** is the number of subscribers who canceled during the period N (day, week, or month) who initiated their subscription *before* that period (i.e., their join date < quit date). Here the ratio is computed as the number of subscribers who quit in period N divided by the subscribers active at the end of period N+1. Historic churn is the figure used to transform churn in lifetime.

2. **Instant churn** is the number of subscribers who canceled the service during the period (day, week, or month) in which they had *initiated* their subscription (i.e., join date = quit date). This is calculated using gross addition, which is the number of new subscribers in the period. The ratio is calculated as: Subscribers who quit in period N/Gross addition of period N. This metric is devised to judge the quality of specific marketing and advertising decisions.

Table 1: **Company.net Internal Report on LTV Drivers**

Metric / Dimension	INSTANT CHURN	HISTORIC CHURN	YIELD	MARGIN
COUNTRY				
SUBSCRIPTION FLIGHT				
TELECOM OPERATOR				

Margin is the contribution margin per customer. It is equal to the average revenue per user (ARPU) minus the cost of service per customer. For example, a $10 subscription to a mobile service (such as ringtones) at a per-customer service cost for content delivery of $4 would generate a margin of $6.

Yield is defined as the ratio between subscribers successfully billed and customer candidates to be billed. For instance, if 1,000 customers signed up but only 550 actually pay, the yield would be 55%.

Monitoring LTV

Monitoring these metrics is useful for evaluating strategic and tactical choices, including different advertising campaigns, the launch of a new product, the launch of an existing product in a new country, cross-sell and upsell campaigns to increase ARPU and improve margin, and so forth.

The typical Company.net report on LTV drivers focuses on a product or service (e.g., music, ringtones, and other value-added services) and includes country, subscription flight (i.e., the scheduling of advertising for a period of time), and telecom operator used to deliver the service (see Table 1). Comparisons at the country level are used to evaluate the success of a product that was already launched in other countries. The type of marketing campaign is linked to the churn of acquired customers in order to gauge the effectiveness of a subscription campaign on a specific product or service. For example, a customer acquired through Google AdWords could have a different churn rate than a customer acquired through Yahoo! My Display Ads or Facebook. Furthermore, customers who are acquired from a specific mobile operator (such as AT&T, Sprint, or T-Mobile) could have different attitudes toward churn and different yield.

These drivers are leading, forward-looking indicators and must be monitored on a daily basis to ensure the company is heading in the right direction. Company presentations often show all customer metrics improving as they look toward the future. This is unlikely to play out in reality. For example, if a firm attempts to raise ARPU (price), it will necessarily increase churn. Similarly, if a firm aims to grow faster by spending more on marketing, CoA will likely rise. Churn may increase as well because a more aggressive marketing campaign will likely capture customers of a lower quality.

The availability of customer data and the particular nature of the business—in which all transactions are made online and the log files of each transaction are constantly registered—is a prerequisite for timely management control of these metrics. This allows Company.net to judge the effectiveness of its marketing investments.

Benefits of a CLV Scorecard

A CLV scorecard makes it possible to examine past customer behavior and understand the drivers of CLV. For example, it can be useful to study how the CLV or CoA of an average customer acquired through Facebook differs from an average customer acquired through Google ad campaigns. In other words, the analysis of the CLV drivers allows managers to test cause-and-effect relationships between managerial actions and results in terms of both customer metrics (churn, CoA, margin, and yield) and financial results (CLV and CE).

Company.net, for instance, regularly monitors these objects or units of analysis:

◆ **Campaigns currently active.** Different channels give different results in terms of CLV. For instance, a customer acquired through Google or Facebook could have a tendency to churn that is different from a Yahoo! or Bing customer. The analysis can be conducted by examining the retention behavior (instant and historic churn) of customers acquired through these channels in order to understand which lifetime those users project.

◆ **Country breakdown** (if the same product or service is provided internationally). This information is quite useful when a service is introduced in a new country because data gathered in a similar country provides an appropriate benchmark. For example, the payback of marketing investments in Brazil could be a good proxy to project what will happen if the firm invests in offering the same services in Chile.

◆ **Different time frames** to monitor different consumer behavior. In this way, a daily or hourly fine-tuning of a marketing campaign could be performed, for example, by changing the bid price on the keyword advertising.[10] In the paid search model described by Des Laffey, monitoring the behavior of clickthroughs via paid search is essential as it provides a precise measurement of the success of the advertising method in terms of achieving the objectives set forth.[11] Data collected from such tracking should then be fed back into the process to make performance reviews more effective. It can help identify if poor-quality prospects are being attracted (perhaps through the use of the wrong keywords) or if clicks from some sources work better than others. Monitor-

ing also ensures that a firm is not paying excessively for clicks. For instance, where the listing position is determined by how much an advertiser is prepared to pay for a keyword or phrase, being in second or third position on a search page may generate as much business as being in first position.

◆ **Different customer characteristics.** Although Company.net managers are interested in computing the CLV of their customers, they are similarly keen on identifying the drivers of a profitable duration in their customer-company relationships.[12] Specifically, the telecommunication carrier can be considered a proxy of income. Moreover, a longer subscription length is a proxy of customer satisfaction because it is well documented in the literature that the longer subscribers remain with a company, the lower the probability that they are going to churn.[13]

Based on the analysis of Company.net log files, the main determinants of a profitable lifetime duration are the type of telephone operator, the length of subscription, and the type of advertising campaign that has convinced the person to become a new customer. Stated in mathematical terms, we can say that a profitable lifetime duration for Company.net is a function of telephone operator, length of subscription, and advertising campaign.

Cohort Analysis

Although churn is the main driver of lifetime, and churn data is crucial for judging the success of a customer acquisition campaign once it is complete, marketing literature raises serious concerns regarding the typical approach of projecting an historic churn rate into the future in order to get the lifetime of acquired customers and then their profit streams (i.e., LTV). Sunil Gupta, Donald Lehman, and Jennifer Stuart demonstrate that the widespread method of converting retention rate to expected lifetime (1/churn rate) and then calculating the present value over that finite time period ultimately overestimates LTV.[14] Peter Fader and Bruce Hardie demonstrate that the retention rate (defined as the opposite of the churn rate) is an increasing function of time.[15] Therefore, the longer subscribers are with the company, the lower the probability

that they are going to churn. Researchers explain this phenomenon with two main reasons.[16] The customer's preference or satisfaction with a product or service increases over time as he or she uses it, thus decreasing churn. Alternatively, an increasing retention rate may be because of cross-sectional heterogeneity in individual retention probabilities across customers in their preference for the product or service.[17] The heterogeniety problem can be particulary severe if the company is showing substantial growth. By definition, growth implies many first-time customers, and their churn can be different from the churn of older customers, thus distorting the view of how much repeat purchase behavior will occur in the future.

Company.net's business intelligence unit recognized and addressed these issues. When it evaluates the potential profit from future customers, the company uses a heuristic methodology to estimate LTV from future acquired customers. The underlying rationale is to use a data-mining approach to project the data of each acquired customer's cohort. Cohort analysis has been used by statisticians for decades, and recent advancements in data collection and processing power have made it a viable technique for online businesses to study customer loyalty trends, predict future revenues, and monitor churn. The most popular cohort analysis (which we present here) involves segmenting customer groups based on a join date. The month, week, or day of that date then becomes the user's cohort, meaning each cohort is the set of users who joined during the same time period.

The pivotal metric used in this analysis is called margin per thousand customers (MpK), which focuses on the projected margin.[18] Basically, Company.net estimates across cohorts an average MpK for the last N months of actual data. After normalizing the data based on previous observations, it projects the average MpK in the future months. The metric is calculated with different windows, namely daily, weekly (preceding seven days), and monthly (preceding 30 days). In all three cases, a notion of CLV with the following characteristics is considered: (1) LTV is based on future profit,[19] and (2) CLV does not directly take into consideration the CoA.[20] Formally, CLV is computed by subtracting CoA from LTV. In other words, acquisition costs are not included as part of CLV. Yet customer acquisition cost is often displayed alongside a customer's LTV. In this way, Company.net gains insights on whether an unprofitable customer's CLV (LTV minus CoA) is negative because of high costs of acquisition rather than a low LTV.

To compute MpK, take the following steps (see the sidebar, "Cohort Analysis at Company.net," for an example):

1. Collect the gross additions (acquired subscribers) for each cohort and the corresponding number of billings (subscribers who effectively pay) in each period. Notice that gross addition is always higher than the number of subscribers billed for two reasons: First, some of the subscribers quit (this phenomenon is measured by churn rate). Second, it is not possible to charge all the candidate subscribers. This is measured by the yield.

2. Multiply the number of billed subscribers by the margin per customer in order to get MpK.

3. Estimate the average MpK among the different cohorts for each period of time considered. Averaging across cohorts provides an average MpK at the end of one month, two months, and so forth (Equation 1).

Equation 1: $MpK_t = margin \frac{1{,}000}{gross\_addition_t} \frac{1}{n-(t-1)} \sum_{t=1}^{n} \#\_Billing_t$

Where: t = period of time
n = total periods where data is available
margin = ARPU – COGS
#_Billing = paid subscribers for each cohort

The estimate also requires a normalization of the data (i.e., outliers are excluded from the average). In most cases, outliers are easily identified based on past experience. Most are the result of problems in the firm's information system that produces the log files.

4. Project the average MpK on the lifetime of the customer in order to estimate how much margin can be obtained from the acquisition of 1,000 customers today. This step makes it possible to estimate the distribution of the MpK across customers' lifetime (Figure 3 in sidebar). As the cohorts mature, there are fewer data points to

Cohort Analysis at Company.net

This example hypothesizes the launch of an online service in a new country at the beginning of the year. The customer acquisition and collection are described in Table 2. The firm acquired an initial cohort of 25,016 customers in the first month. These customers produced the following stream of payment: 8,614 billing events in the first month, 13,437 in the second month, and so on. Another cohort of 38,862 customers was acquired in the second month, which generated a separate stream of billing events (15,086 in the first period, 27,082 in the second, and so on).

Table 2: Customer Acquisition (Gross Addition) and Collection (Billing Events)

Cohort	Period of Time	January	February	March	April	May
	Gross Addition	**Number of Customers Billed**				
Cohort 1	25,016	8,614	13,437	15,516	12,658	9,316
Cohort 2	38,862		15,086	27,082	22,085	15,996
Cohort 3	54,985			32,380	35,906	26,036
Cohort 4	68,099				36,220	35,276
Cohort 5	51,851					19,798

Note: Figures were disguised by a constant multiplier for confidentiality reasons.

For the calculation of MpK, it is necessary to complete the scenario with ARPU as the input variable. The example covered here uses an ARPU of $10, which is considered to be booked at the beginning of the contract period, and a cost of service of $3.50, which makes a contribution margin of $6.50. The customer acquisition cost is $11 per customer (this figure is estimated looking at the ratio of marketing cost/gross addition).

At the end of May, managers raise the following questions:

1. All else being equal, what is the expected contribution of the next 1,000 customers we will acquire?
2. What is the marketing investment's payback period?
3. If we stop investing in this market or service, what is the expected residual value of the customers currently on the firm's books (i.e., customer equity of current customer base)?

To answer these questions, a report can be developed that follows the MpK rationale. The first step is to transform billing events in monetary terms by multiplying billing events by margin and scaling the result by 1,000 customers (Table 3). For example, the January figure ($2,238) has been obtained by multiplying 8,614 (January's billing) by $6.50 (Margin). This is then multiplied by (1,000/25,016) in order to scale by 1,000 customers.

Table 3: Evolution of Gross Margin for Each Cohort

Cohort	Period of Time	January	February	March	April	May
	Gross Addition	**Gross Margin X # customers billed scaled by 1,000 customers**				
Cohort 1	25,016	$2,238	$3,491	$4,032	$3,289	$2,421
Cohort 2	38,862		$2,523	$4,530	$3,694	$2,675
Cohort 3	54,985			$3,828	$4,245	$3,078
Cohort 4	68,099				$3,457	$3,367
Cohort 5	51,851					$2,482

Note: Figures were disguised by a constant multiplier for confidentiality reasons.

The next crucial step requires computing an average contribution margin estimated for each period. The question is: "How much margin should be expected from 1,000 customers acquired today?" Given Equation 1, it follows that 1,000 acquired today are expected to provide a gross margin of $2,905.65 in the next month (average of $2,238; $2,523; $3,828; $3,457; $2,482); $3,908 in the second month (average of $3,491; $4,530; $4,245; $3,367), and so forth (see Table 4). As the cohorts age, there are fewer data points to average. Hence, for the subscribers who began in January, there are five months of data; for the subscribers who began in February, there are four months of retention data, and so forth. The number of actual data (i.e., number of cohorts) depends on data availability, with the usual range from a minimum of two to a maximum of 12 months of past data. Regarding the normalization of the data, the analysis of the standard deviation allows detection of cases in which the average is biased from outliers. In those cases, the outliers are removed from the average.

Table 4: Projection of MpK in the Future

	Time Period	MpK	Standard Deviation	Rate
Average of past data	1	$2,906	$694	35%
	2	$3,908	$567	- 8%
	3	$3,601	$484	- 17%
	4	$2,982	$434	- 19%
	5	$2,421	-	- 17.9%
Forecast decrease (rate x 95%)	6	$1,988		- 17.0%
	7	$1,650		- 16.1%
	t	…		…
	35	$123		- 3.8%
	36	$118		- 3.6%

A typical pattern found in Company.net is that, following an initial period of time, MpK tends to level off month by month. With such a pattern, the company can extrapolate forward using the same month-by-month decrease across several months. To forecast the evolution of MpK for the cohort for which data is not available (Cohort 6 and beyond in this example), the following algorithm is applied: The drop from the previous month is multiplied by the percentage, an x% of decrease, to account for a decrease in churn rate (in this example, the percentage of decrease is 95% for each month). This example includes five months of data. That is extrapolated forward using the same month-by-month decrease (on the basis of previous experience) for the subsequent 31 months. Stated differently, MpK of period 6 (1,988) is obtained as follows: 2,420.61 x (- 19% x 95%). This method allows Company.net to project a cohort's MpK in the future, estimating the distribution's tail (as exhibited on the right side of Figure 3). At Company.net, this estimation procedure usually does not exceed 36 months when forecasting MpK.

Table 4 provides an answer to the managers' first two questions. Namely, 1,000 customers acquired today would produce a margin of $31,121 ($2,906 + $3,908 +…+ $123 + $118) during the next 36 months. This result is obtained with the following formula:

$$\overline{MpK}_{36 \text{ months}} = \sum_{t=1}^{36} MpK_t$$

This figure must then be compared with CoA to obtain a CLV of $20,221 ($31,121 – $11,000), as illustrated in Table 5.

The payback of the marketing campaign is obtained from Table 4 by summing up MpK until $11,000 (i.e., $2,906 + $3,908 + $3,601 + $2,982). This is quite relevant information when firms have to optimize the resources spent on customer acquisition and evaluate the risk of a marketing investment.

Figure 3: Distribution of MpK for the Average Cohort
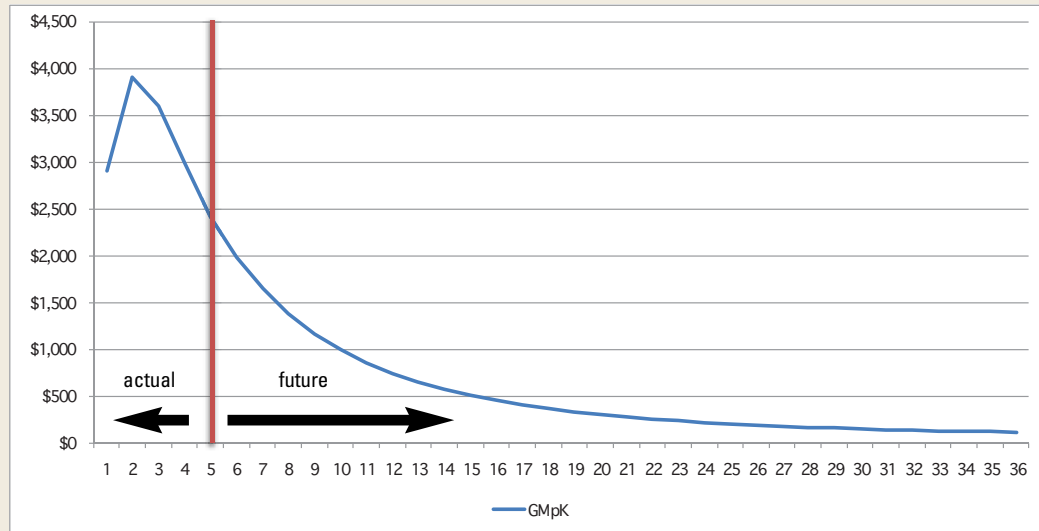
Note: The graph plots the distribution of the monthly margin of the "next" 1,000 customers being acquired. The vertical line at the fifth month separates the estimation based on actual data (first five months) from the projection of the tail applying the previous monthly change and a certain rate of decrease (e.g., 95%).

Table 5: Typical Report to Make Decisions

INPUT				
ARPU	COGS incidence	Margin	CoA estimate	Payback period
$10	35%	$6.50	$11	4.0

OUTPUT	
$\overline{MpK}_{6months}$	$17,805
$\overline{MpK}_{12months}$	$24,621
$\overline{MpK}_{36months}$	$31,121
Cost of Acquisition	$11,000

Note: The report highlights the relation between CoA and CLV (estimated using MpK). These kinds of reports are crucial in order to judge the contribution of new subscribers to value creation. The value of future customers and the payback period alone, however, are not sufficient to obtain a full picture. The other piece of information required to make a rational decision in this business setting is customer equity (CE).

To answer the third question, a further step is needed to estimate the CE of current customers, extending the actual data of each acquired cohort (from 1 to 5) with the estimation for the future. This means that data in Table 6, column A must be projected into the future using data from Table 6, column B. Hence, for each cohort we sum up the future periods (i.e., for Cohort 1, the period 6 to 36; for Cohort 2, period 5 to period 36; for Cohort 3, period 4 to 36; for Cohort 4, period 3 to 36; for Cohort 5, period 2 to 36). The last step is to unscale the data in order to consider the real gross addition for each cohort because all the calculations made so far refer to 1,000 customers. The result is a CE of the current customer base of $5,328,426 (Table 6). A CE of $5,328,426 can be considered as the value embedded in the acquired customer base.

Table 6: Estimation of Customer Equity for the Current Customer Base

	A	January	February	March	April	May	B	C= (A/1,000)*B
	Gross Addition	Margin X # customers billed scaled by 1,000 customers					Customer equity scaled per 1,000 customers	Customer equity of current customer base
Cohort 1	25,016	$2,238	$3,491	$4,032	$3,289	$2,421	$15,303	$ 382,820
Cohort 2	38,862		$2,523	$4,530	$3,694	$2,675	$17,724	$ 688,790
Cohort 3	54,985			$3,828	$4,245	$3,078	$20,706	$1,138,519
Cohort 4	68,099				$3,457	$3,367	$24,307	$1,655,282
Cohort 5	51,851					$2,482	$28,215	$1,462,976
Customer base	238,813							$5,328,387

Note: *Customer equity scaled per 1,000 customers* is the value at the end of May of 1,000 customers acquired in each of the five cohorts. *Customer equity of current customer base* is obtained from the sum of the unscaled customer equity of each cohort.

Because of the normalization of the data, the performance measurement system of Company.net is also able to simulate the effect of other factors that are not under the control of the company, including competitor actions, regulation changes, or technological discontinuities—any of which may affect the consumer behavior in both conversions and retention. This is particularly important when it is necessary to neutralize the effect of these factors from the metric utilized as the base for managers' bonuses. For example, consider the case of a problem in the log files transmitted from the telecommunications carriers to Company.net for a specific cohort.

(NOTE: A copy of the Excel file used in the analyses is available from the authors by request.)

average across, so the potential for error increases. Nevertheless, it is still a useful exercise to get an idea of future margin associated with the acquisition of 1,000 customers. How far into the future the estimation can be extended depends on the type of business. At Company.net, the following metrics are computed across different time ranges:

- $\overline{MpK}_{1month} = MpK_1$: expected margin of the next 1,000 customers in the first month.
- $\overline{MpK}_{6months} = \sum_{t=1}^{6} MpK_t$: expected margin of the next 1,000 customers after six months.

- $\overline{\mathrm{MpK}}_{36\text{months}} = \sum_{t=1}^{36}\mathrm{MpK}_t$: expected margin of the next 1,000 customers after 36 months

In theory, CLV models should estimate the value of a customer over the customer's lifetime, but many firms, including Company.net, consider three years to be a reasonable estimate for the horizon over which the current business environment (with regard to technology, competition, and so forth) would not change substantially.[21]

TAKEAWAY

The goal of this case study was to provide management accountants with a better understanding of how to ascertain the preferences of new and latent customers in a typical subscription-based business model. It involves directly observing the customer's purchase behavior and subsequently linking this data to customer value and firm performance.

Calculating CLV (and, by extension, CE) is not enough because managers need to examine CLV drivers using a framework that makes cause-and-effect relationships between managerial actions and key customer metrics visible. There is no such thing as an average customer lifetime. Because the typical survival curve drops quickly and then levels off, better-informed decisions can be made if customer groups are segmented based on a "join date." Failing to do so will undervalue a firm's CE.

For every decision, such as the launch of a service in a different country, a new advertising campaign, and so forth, managers need to rely on reports showing how that decision will impact future CLV and CE. This will allow decision makers to better answer questions about the types of customers to retain, grow, or acquire, as well as how much should be invested to do so. The use of CLV and CE also helps managers understand which advertising channels are more effective and efficient and how to increase the value of the customer base. ∎

Massimiliano Bonacchi, Ph.D., is an associate professor at the University of Naples "Parthenope" and an adjunct professor of accounting at NYU Stern School of Business. He can be reached at massimiliano.bonacchi@uniparthenope.it.

Paolo Perego, Ph.D., is an assistant professor at the Rotterdam School of Management, Erasmus University Rotterdam. He can be reached at pperego@rsm.nl.

END NOTES

1 V. Kumar and Bharath Rajan, "Profitable Customer Management: Measuring and Maximizing Customer Lifetime Value," *Management Accounting Quarterly*, Spring 2009, pp. 1-18.

2 Peter S. Fader, *Customer Centricity: Focus on the Right Customers for Strategic Advantage*, Wharton Digital Press, New York, N.Y., 2012.

3 Paid search advertising entails advertisers competing for top listing position by bidding in ongoing auctions and then paying when users click on the advertisements, making paid search a flexible and accountable form of advertising (see Des Laffey, "Paid Search: The Innovation that Changed the Web," *Business Horizons*, 2007, pp. 211-218). Pay-per-click ads are one of the most cost-effective advertisement tools. They are the "sponsored ads" that are displayed at the top and right of the search results on Google, Facebook, Yahoo!, Bing, and similar websites. Payment for these ads occurs whenever someone actually clicks on an ad, not when it gets displayed. The cost per click can range anywhere from a few cents to several dollars, depending on the type of industry and keywords.

4 Christopher S. Chapman, *Controlling Strategy: Management, Accounting, and Performance Measurement*, Oxford University Press, New York, N.Y., 2005; Robert H. Chenhall, "Management Control Systems Design within Its Organizational Context: Findings from Contingency-based Research and Directions for the Future," *Accounting, Organizations and Society*, 2003, pp. 127-168; Jean-François Henri, "The Periodic Review of Performance Indicators: An Empirical Investigation of the Dynamism of Performance Measurement Systems," *European Accounting Review*, 2010, pp. 73-96; Ralph Kober, Juliana Ng, and Byron J. Paul, "The Interrelationship Between Management Control Mechanisms and Strategy," *Management Accounting Research*, 2007, pp. 425-452.

5 Kumar and Rajan, Spring 2009.

6 Julian Villanueva and Dominique M. Hanssens, "Customer Equity: Measurement, Management, and Research Opportunities," *Foundations and Trends in Marketing*, 2007, pp. 1-95.

7 CEcur can be considered a special case of CEtot, where the acquisition of future customers is a project with a net present value of zero, as seen in Massimilliano Bonacchi, Kalin Kolev, and Baruch Lev, *Customer Franchise—A Hidden, Yet Crucial Asset*, Canadian Academic Accounting Association, Ontario, Canada, 2012. See also John E. Hogan, Donald R. Lehmann, Maria Merino, Rajendra K. Srivastava, Jacquelyn S. Thomas, and Peter C. Verhoef, "Linking Customer Assets to Financial Performance," *Journal of Service Research*, 2002, pp. 26-38; and

V. Kumar and Denish Shah, "Expanding the Role of Marketing: From Customer Equity to Market Capitalization," *Journal of Marketing*, 2009, pp. 119, for more about CEtot.

8 Massimiliano Bonacchi, Mascia Ferrari, and Massimiliano Pellegrini, "The Lifetime Value Scorecard: From E-Metrics to Internet Customer Value," *Performance Measurement and Management Control: Measuring and Rewarding Performance*, 2008, pp. 193-226.

9 In theory, the issue of the time-value of money must be also considered, usually discounted in the CLV formula, in order to get an estimate of future profits. Discounting may be very appropriate in some businesses, particularly for firms operating in markets with a very long cycle, high ticket retail, and B2B. But it is believed that the discounted practice may confuse the analysis in a B2C where the environment is very dynamic, and it is better to adopt a simplified approach.

10 When a user searches for a specific keyword, the order of the results the user obtains is determined by current bids in the auction. Payment is made by advertisers each time a user searches for a term and then clicks on their link.

11 Laffey, 2007.

12 Werner J. Reinartz and V. Kumar, "The Impact of Customer Relationship Characteristics on Profitable Lifetime Duration," *Journal of Marketing*, 2003, pp. 77-99.

13 Peter S. Fader and Bruce G.S. Hardie, "How to Project Customer Retention," *Journal of Interactive Marketing*, 2007, pp. 76-90; Peter S. Fader and Bruce G.S. Hardie, "Customer-base Valuation in a Contractual Setting: The Perils of Ignoring Heterogeneity," *Marketing Science*, January-February 2010, pp. 85-93; and Sunil Gupta and Donald R. Lehmann, *Managing Customers as Investments: The Strategic Value of Customers in the Long Run*, Wharton School Publishing, Upper Saddle River, N.J., 2005.

14 Sunil Gupta, Donald R. Lehman, and Jennifer A. Stuart, "Valuing Customers," *Journal of Marketing Research*, 2004, pp. 7-18.

15 Fader and Hardie, 2007, and Fader and Hardie, 2010.

16 Robert C. Blattberg, Byung-Do Kim, and Scott A. Neslin, *Database Marketing: Analyzing and Managing Customers*, Springer Science + Business Media, New York, N.Y., 2008.

17 For example, see Gupta and Lehmann, 2005.

18 Using the same rationale, Company.net also computes revenue per thousand customers (RpK), which focuses on projected revenues instead of margin. In the example, we concentrate on the MpK evolution, but the same report can be adopted for RpK because gross margin is a percentage of revenue (in this example, 65%), and the difference between RpK and MpK is merely a question of scale. Our choice to present MpK is because we are able to calculate CE with this metric.

19 See Robin Gleaves, Jamie Burton, Jan Kitshoff, Ken Bates, and Mark Whittington, "Accounting Is from Mars, Marketing Is from Venus: Establishing Common Ground for the Concept of Customer Profitability," *Journal of Marketing Management*, September 2008, pp. 825-845, for a distinction between cash flow and profit.

20 When it comes to making informed prospecting decisions, there are at least two ways of considering acquisition spending: Do not include acquisition spending and compare the lifetime value (LTV) to CoA or include acquisition spending in the specification of customer value—correctly labeled as CLV—and compare the value of CLV to zero. See Phillip E. Pfeifer, Mark E. Haskins, and Robert M. Conroy, "Customer Lifetime Value, Customer Profitability, and the Treatment of Acquisition Spending," *Journal of Managerial Issues*, March 22, 2005, pp. 11-25.

21 Kumar and Rajan, 2009, and V. Kumar, Rajkumar Venkatesan, Tim Bohling, and Denise Beckmann, "The Power of CLV: Managing Customer Lifetime Value at IBM," *Marketing Science*, May 7, 2008, pp. 585-599.