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Customer-driven menu analysis (CDMA): Capturing customer voice in menu management

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ABSTRACT

This study develops a new, holistic, customer-driven menu analysis (CDMA) model that incorporates a version of restaurant profitability analysis based on experience accounting and value-based cost management. The CDMA model comprises four stages: the customer's voice; cost allocation; menu analysis; and profitability analysis. A constructive research approach was used to develop, elaborate and test the new CDMA model in the context of a large restaurant in Auckland, New Zealand. The model can be used by restaurateurs to view their cost structure in a fully customer-driven and nuanced way to improve operational and financial decision-making for enhanced restaurant performance.

1. Introduction

The food service sector is one of the largest and fastest growing industries in the world (Lovelock et al., 2015). Despite its importance, there is high rate of failure. Over 26% of new restaurant operations founder during the first year, and within three years, nearly 60% of all restaurants end up in failure (Parsa et al., 2015). A major contributing factor is that the industry is operating with relatively low profit margins and suffering from a lack of financial flexibility (Raab and Zemke, 2016). Consequently, many operators see managing their scarce resources (relating to labour costs, operating costs and food costs), while still maintaining and building sales, as their greatest challenge (Williamson et al., 2013).

Restauranteurs believe that the menu is one of the key determinants of restaurant success, because the menu performs a number of important functions for both the restaurant and the consumer (McCall and Lynn, 2008). Consequently, there has been growing academic interest in menu research, with studies covering the areas of menu planning, menu design, menu pricing and menu analysis (e.g., Hou et al., 2017; Kim et al., 2018; Ozdemir and Caliskan, 2015). Menu analysis (MA) refers to a broad range of analytical and systematic techniques to help businesses identify opportunities for improved performance. In particular, MA is used to determine management action that can be taken to reprice, eliminate, reposition or recost menu items (Raab, 2003).

There are many different approaches to MA, each promoted as a practical tool to manage the restaurant operation. Most of these approaches focus internally – on the organisation (e.g., internal costs). They fail to link internal cost structures to externally defined value; i.e. they ignore value from the customer's perspective. These organisation-centric practices restrict the effectiveness of current MA models. The foundation of a sound business lies in understanding what customers value and why (McNair et al., 2001a,b). Customer value is the relationship between the perceived benefits and the sacrifice necessary to obtain those benefits, and research shows that a customer's dining experience is directly related to customer satisfaction and post-consumption behaviour (e.g., Taylor et al., 2018; Torres et al., 2018). Although there have been some attempts to include customer satisfaction in MA models, few adequately include the customer perspective in the menu evaluation process or attempt to identify customer-defined value attributes that can be mapped to internal activities of restaurants. The whole meal experience as perceived by the customer should be considered by management, because concurrent contextual effects can alter the perception of food during consumption (Edwards, 2013). Extant MA models, however, focus on the food component only and have not incorporated contextual issues.

This study sets out to develop a customer-driven menu analysis (CDMA) model built on customer-defined experience preferences linking the internal cost structures of the restaurant to externally defined (customer) values. The study contributes to the MA literature by providing a coherent and comprehensive understanding of current MA methods, as well introducing a new, more holistic and contemporary MA model. The study also aims to help restaurateurs improve their

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financial/operational decision-making and manage their businesses more effectively. The aim of the study, therefore, is to find a theoretically robust and practical solution to a business-related problem in a real industry setting. The constructive research approach (CRA) was adopted to achieve the study's objective as it allows the researcher to work cooperatively with industry to find a solution to a problem identified in current literature and in practice.

The remainder of this article is organised as follows: first, it reviews the existing literature on restaurant menu analysis approaches, establishing the foundations of the CDMA model proposed in the section that follows. Within these first two sections, five research propositions are identified. Next, the research design is discussed with details of the context and the CRA. The results for each of the five research propositions are then presented. The paper concludes with a summary of the main findings, their contribution to theory and practice, and recommendations for further research.

2. Restaurant menu analysis approaches

The menu is a central component of the success of any restaurant. Menu analysis (MA) is a generic term for any approach that strives to improve menu performance (Jones, 2004). MA typically determines the appropriateness of individual menu items in terms of the cost and selling price, at the same time enabling management to analyse combined food costs and selling prices for the whole menu. It helps operators to identify current trends and allows for a reasonably in-depth analysis of profitability and performance, providing information for budgeting and performance measurement (Shan, 2000). For nearly 40 years, researchers and practitioners have investigated the topic and several MA models have been developed. Many have been based on the matrix (or two-dimensional) approach (Kasavana and Smith, 1982; Miller, 1980; Pavesic, 1983) but their usefulness is limited because the data they use is only food cost and sales-related. In an attempt to add more quantitative data, Raab (2003) modified Cooper's (1989) manufacturing activity-based costing (ABC) model to develop a version for the restaurant industry. However, the ABC method is both cumbersome and time consuming (Taylor et al., 2009). In an attempt to include the customer perspective in the process, Salem-Mhamdia and Ghadhab (2012) expanded the ABC concept to include 'menu item satisfaction score' as an element of the MA. However, this score is only one customer-related factor, and therefore this MA method still ignores many of the contextual effects that influence the complete dining experience.

To incorporate more variables into the MA models, two multidimensional approaches emerged as an alternative to the matrix models. The first is a method based on five performance dimensions of the operation – food cost, selling price, labour cost, popularity and contribution margin (Cohen et al., 1998). All menu items can be evaluated independently or compared with other menu items based on their distribution within a polygon. Although this approach includes the labour cost as a variable, there is no clear indication of how the labour cost is measured or calculated, nor does it consider any other factors of production as possible variables. To integrate more input variables into the MA process, Fang and Hsu (2014), Taylor et al. (2009) and Ting et al. (2010) suggested the use of data envelopment analysis (DEA) to consider multiple inputs and outputs and to incorporate both quantitative and qualitative factors within the MA process. DEA measures the relative efficiency of each menu item and ranks them in a single 'relative-to-best' index. Menu items are thus compared against the best performing item rather than against the average of the menu items. There are a number of studies demonstrating the use of the DEA technique. Each demonstrates that one of the key features of DEA is how it reveals the relationship between business financial performance and menu item efficiency scores (Fang and Hsu, 2014; Reynolds and Biel, 2007; Taylor et al., 2009). While the DEA technique includes a number of input and output variables, the customer perspective is rarely incorporated in the analysis (Alberca and Parte, 2018). As Reynolds and Biele (2007, p. 354) noted, "guest satisfaction has been the most elusive output variable, yet many consider it the most important as an indicator of long-term success."

Although there are many different approaches to MA, all stressing the importance of accurate cost information, there is no direct evidence to show that the costing of individual menu items or the overall menu evaluation process adequately includes the customer perspective (Nemeschansky, 2017). Many of them also fail to acknowledge contextual effects – ones that can alter the perception of food during consumption (Edwards, 2013). Instead of considering the context in which the consumption experience occurs, these MA models view the product in isolation by trying to match the food to the consumer. Restaurateurs are also hesitant to implement MA in their daily operation. This is perhaps because many MA models are conceptual in nature and the more advanced models appear to be difficult and time consuming to implement.

In addition, extant MA models focus on product profitability rather than customer profitability. Consequently, even though many of these models include detailed operational cost information, they do not explain how much it actually costs to serve a customer, which frequently depends upon customer behaviour, rather than the service provider. Because of this, Kaplan and Narayanan (2001) have stated that profitability per customer is more important than profitability per product. An awareness of the true cost of serving a specific customer segment is essential for an organisation, and it follows that detailed customer cost information is critical for effective managerial decision-making and the overall profitability of the business (Dalci et al., 2010). Likewise, restaurateurs need to have an in-depth understanding of the actual cost involved in serving customers.

The cost management tools currently used in the restaurant industry still evaluate the customer from the *company's* perspective without including the *customer* in the actual process. McNair et al. (2001a,b) advanced a value creation model that classifies business expenditure as five specific types of *costs* that the organisation incurs. *Value* is the benefit the customer perceives as a result of this expenditure. The market price confines that which a business can charge and ultimately affects profit. Therefore, management must have a thorough understanding of the target market and its value requirements if they are to increase profits. The value creation model also allows the calculation of value multipliers, a central concept for improved customer value and business profit (McNair-Connolly et al., 2013a).

This study used the value creation model as the framework to present the financial information and, specifically, the income statement in a more customer-centric format. Overhead costs are classified into the following five cost types: customer value-added (CVA); business value-added current (BVA-C); business value-added future (BVA-F); business value-added administrative (BVA-A); and non-value-added (NVA) (Fig. 1).

While some of the earlier activity-based MA models (Raab, 2003) have identified value-added costs, there is no indication that these costs are viewed from a customer perspective. The integration of the value creation model directly into the reporting system of the restaurant allows the internal cost structures of the restaurant to be linked to externally defined values. This helps management understand the relationship between business expenditure and how customers value the resulting output. By having an in-depth understanding of customer-defined value, restaurateurs can create an effective competitive strategy. As McNair-Connolly et al. (2013a) noted: "It is not enough to say that the customer comes first; every system used by the company has to position the customer as its first priority" (p. 6). This gives rise to the first research proposition:

RP1: A restaurant can identify costs that directly add value to the customer experience.

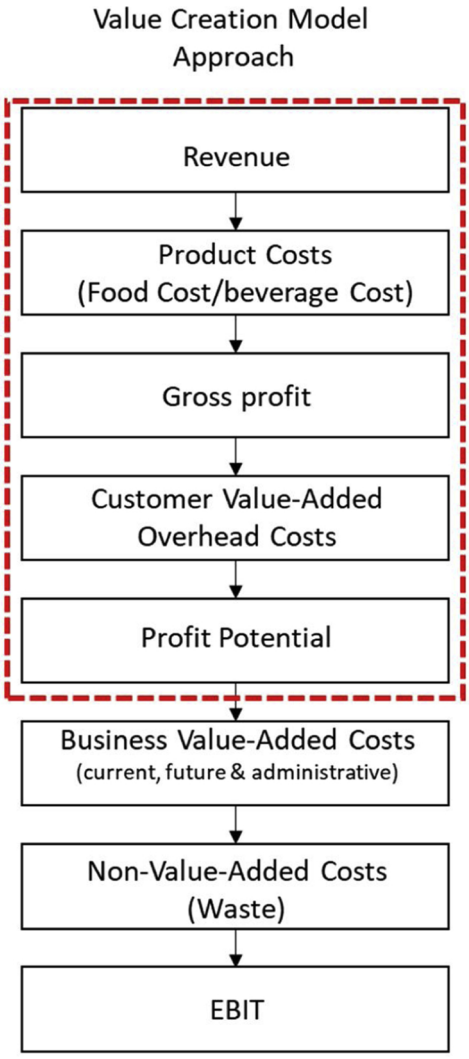

Fig. 1. Value creation model income statement (EBIT = earnings before interest and tax).
Source: Adapted from McNair et al. (2001a,b); McNair-Connolly et al. (2013).

3. Development of the customer-driven menu analysis (CDMA) model

Restaurateurs need to understand their customers' needs and expectations if they are to succeed (Arora and Singer, 2006). According to Jensen and Hansen (2007), restaurants require real information about the meal experience as it relates to the customers' point of view. They should not still be managing their operations as if they were supplying products, rather than building experiences (Carlbäck, 2011). Guided by the literature, a CDMA model was developed to address the before-mentioned problems associated with current MA methods. The model embeds the customer perspective at every stage of MA and demonstrates that the key element in any menu analysis is 'externally-defined value' (as defined by the customer). The model, presented in Fig. 2, comprises four components: (1) the customer's voice; (2) cost allocation; (3) menu analysis; and (4) profitability analysis. Each component represents a stage in CDMA and is associated with one or more steps that aid the implementation of the model in a real restaurant setting. As discussed in detail below, each stage of the model is associated with one of five research propositions. This provides a way to both measure the utility of the model and to test that every stage of the model clearly incorporates the customer perspective. The model can be applied to many of the current MA methodologies. Use of the model will help restaurateurs determine what their customers value and are prepared to pay for, and on the other hand, what they are not prepared to pay for.

3.1. Stage 1: the customer's voice

RP1, presented at the end of section 2, proposes that it is possible for a restaurant to identify costs that directly add value to the customer experience. Hence, the first stage of the CDMA model aims to identify restaurant-specific, customer-defined dining experience value attributes (DEVAs). Management can then make a connection between the attributes and the actual costs the restaurant incurs when delivering those attributes. This approach addresses two significant issues: (1) the importance of the dining experience, and the fact that currently many MA models tend to be organisation-centric; and (2) the use of management accounting techniques that often ignore the customer value perspective.

The underlying notion of the CDMA model is that the restaurant can identify DEVAs and then quantify them based on a customer's willingness to pay for them. For the CDMA model development, the value attributes were categorised into the following seven DEVAs: online experience, atmospheric experience, service experience, people experience, culinary experience, dietary experience and co-creation experience (Nemeschansky et al., 2015).

3.2. Stage 2: cost allocation

This stage of the model was designed to ensure that the customer perspective was included in the costing of individual menu items, thus facilitating the calculation of menu item profit potential (PP) and earnings before interest and tax (EBIT). This profitability calculation identifies costs that relate both to customer value and customer preferences (DEVAs).

As the literature review highlighted, to account for the *total* cost of producing a meal, successive MA models have attempted to add new variables to the process, and then to allocate the total costs to individual menu items. However, the common feature has been their organisation-centric approach to both cost determination and cost allocation. The CDMA approach overcomes this problem by integrating the value creation model of McNair et al. (2001a,b) into the MA model. Consequently, all the operating costs are now categorised based on the customer-defined value concept.

'Product costs' are first allocated directly to menu items, after which all other overhead costs (CVA, BVA current, future and administrative, and NVA) are allocated using time-based equations derived from the functional analysis performed at the restaurant. Instead of being transaction driven, these duration drivers are similar to those used by time-driven activity-based costing (Kaplan & Anderson, 2007). This gives rise to the next two research propositions:

RP2: A restaurant can trace costs to menu items through the activity analysis of functions.

RP3: A restaurant can calculate the 'profit potential' (PP) and 'earnings before interest and tax' (EBIT) of individual menu items.

3.3. Stage 3: menu analysis

The data from the individual 'statements of cost' for each menu item are used to perform the MA. The CDMA model facilitates MA using a range of common methods, such as the matrix approach, profitability analysis and multidimensional approach. When CDMA is applied, two approaches can be adopted – the *customer value-added cost* or the *total costs* approach. The former categorises costs as *food costs* and *customer value-adding overhead costs* and the latter incorporates all costs, that is, *CVA*, *BVA current*, *future and administrative*, and *NVA*. The choice of

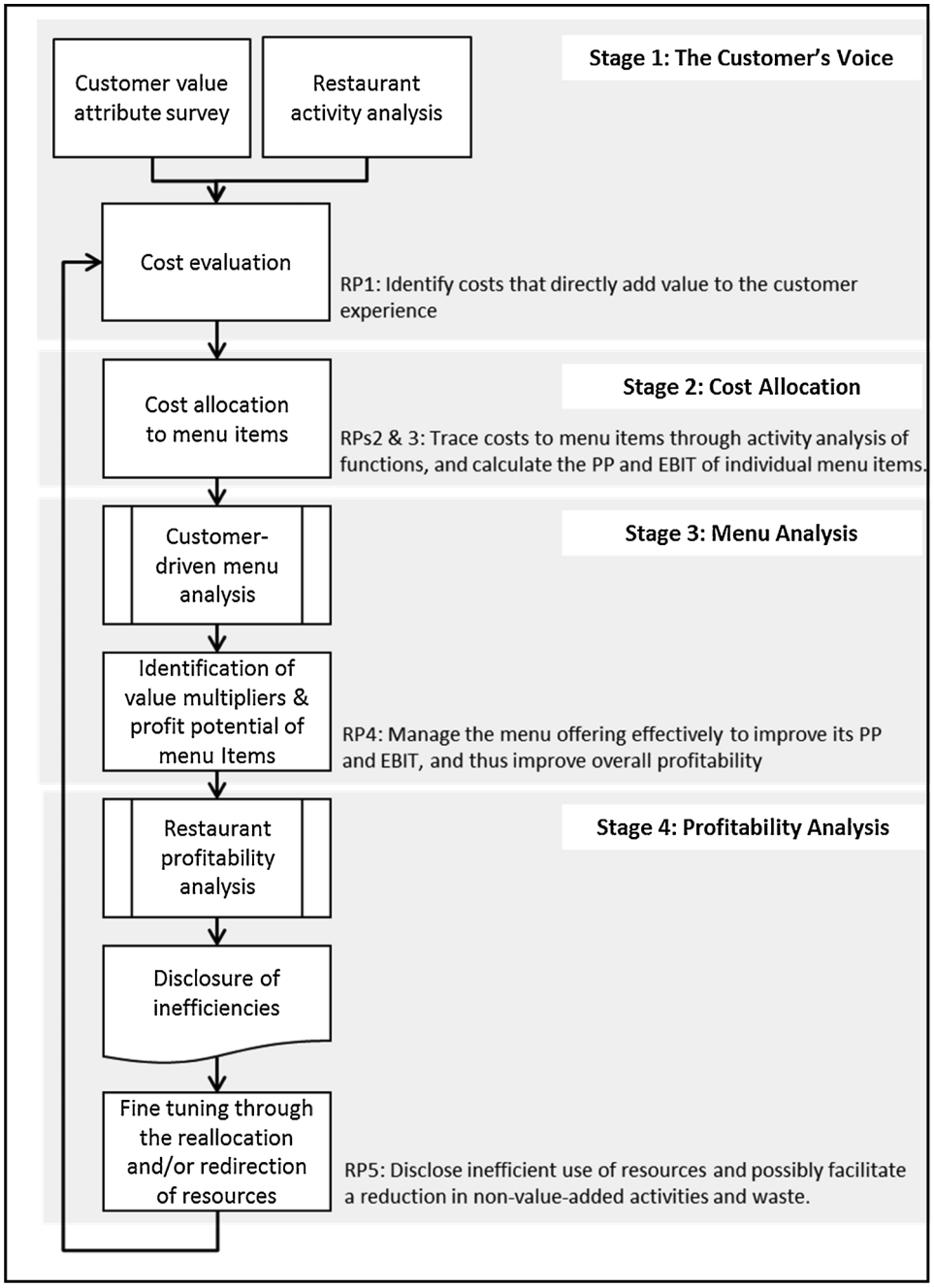

Fig. 2. The foundations of a new customer-driven menu analysis (CDMA) model (PP = profit potential; EBIT = earnings before interest and tax).

approach allows the menu to be analysed using either the PP and/or EBIT as financial performance indicators.

The shortcomings of variable interdependency associated with the matrix approaches can be overcome by applying the data to other MA methods: (1) goal value menu analysis that also incorporates multi-dimensional analysis (Cohen et al., 1998; Hayes and Huffman, 1985); or (2) MA that is based on data envelopment analysis (DEA). The goal value model can be further enhanced with the inclusion of a visual representation of each menu item as a polygon in a two-dimensional space (Cohen et al., 2006, 1998). The menu analysis using DEA assesses the efficiency scores for each menu item (for details, refer to Section 4.4.3). Hence, it is proposed that:

RP4: A restaurant can manage the menu offering effectively to improve its PP and EBIT, and thus improve overall profitability.

3.4. Stage 4: profitability analysis

Here the CDMA model takes on a strategic emphasis and assists management in gaining an in-depth understanding of what the customer actually values. By factoring in the customer perspective, the aim is to help management focus on activities and outcomes that ultimately grow the restaurant's revenue and profitability. Through the process of restaurant profitability analysis, the subsequent disclosure of possible inefficiencies and the fine-tuning of resources as a result of this work, management has the ability to develop effective strategies that relate directly to the customer's perception of value and satisfaction. The profitability analysis also discloses any inefficiencies and facilitates a reduction in NVA activities and waste. The final proposition to be tested in this research is:

RP5: A restaurant can identify inefficient use of resources and

possibly facilitate a reduction in non-value-added activities and waste.

In addition to developing a CDMA model, the research aimed to compare CDMA with other MA methods to assess the extent to which CDMA is practical in a real operating context.[1]

4. Methodology

4.1. Context

The researcher had access to a 90-seat contemporary bistro serving breakfast, lunch and dinner seven days a week, located close to the waterfront in downtown Auckland in New Zealand. At the time of research, the average weekly revenue was $74,090, generating an average spend of $28.10. The bistro employed 14.2 'full-time equivalent staff' in the kitchen and 18.2 in the restaurant, covering an average of 1,296 h per week. The bistro focused on garden-to-table dining, a philosophy whereby all food served is locally sourced, with ingredients such as citrus, pecans and figs produced in the restaurant group's own orchard. The bistro's breads and baked goods were prepared fresh each day at the group's central artisan bakery, while sweets and desserts were freshly prepared at the adjoining dessert restaurant.

4.2. Constructive research approach (CRA)

According to Kasanen, Lukka and Siitonen (1993, as cited in Lindholm, 2008), the constructive research approach (CRA) is "a solution-orientated normative method where target-orientated and innovative step-by-step development of a solution are combined, and where empirical testing of the solution is done and utility areas are analysed" (p. 345). CRA requires there be (1) a practical problem, one that is interesting from the research perspective and involves collaboration with the organisation, and (2) a theoretical foundation against which the practical problem can be compared (Kasanen et al., 1993). The study met both requirements.

CRA has three phases, briefly summarised as: (1) the *preparatory phase*, involving the identification of an industry-related practical problem; (2) the *fieldwork phase*, involving the collection of empirical data to create a novel construct and the subsequent implementation of it; and (3) the *theorising phase*, where practical and theoretical connections are made. The advantage of the CRA is that it allows the researcher to work together with an industry partner, an important prerequisite for this study.

4.3. Data collection

The data gathering for model development commenced with team meetings to educate the bistro's management in the aims of the project and to plan the operational sequence of data collection. The restaurant's financial records were scrutinised to provide the secondary data needed. Primary data was obtained in meetings with management team and key staff members and through surveys. A summary of the key elements of Stage 1 of the CDMA model – the Customer's Voice – is presented in Fig. 3.

Three separate staff meetings took place to ensure that everyone was clearly briefed on all aspects of the project. The initial meeting covered key objectives of the project, whereas the second meeting focussed more on specifics regarding survey arrangements and financial data requirements. The third meeting was with senior management only to access and review detailed financial and operational data.

[1] Some of the calculations in this study are based on algorithms that have commercial value and are being used to develop a computerised version of the CDMA model. Consequently, detailed information on how to calculate some of the figures are not included in this article. Further explanations of calculations can be forwarded to the reader if required.

Three surveys were developed based on earlier work by Nemeschansky et al. (2015) and Nemeschansky (2017). Surveys 1 and 2 were conducted over a six-week period and respondents for both surveys were selected using a systematic sampling method with every 10th customer being the sampling target. The management team of the restaurant (including head office) was the sampling target for Survey 3. The survey objectives were as follows:

- Survey 1 aimed to measure restaurant customers' perception of their dining experience to identify the areas that were either under or over performing via importance-performance analysis. The survey consisted of 31 questions assessing the importance and performance of seven DEVAs. The participants (N = 206) were informed that the questionnaire was in two parts with the first part to be completed before the meal (i.e., importance) and the second part after the meal (i.e., performance). Importance was measured on a five-point Likert scale ranging from (1) 'not important' to (5) 'very important' and performance on a scale from (-2) 'fell short of expectations' to (+2) 'greatly exceeded expectations'.
- Survey 2 gathered data from another set of customers (N = 204) who assessed customer value attributes. They were asked to choose from a five-point Likert scale ranging from (1) 'not important' to (5) 'very important', in response to 31 questions covering the perceived importance of the seven DEVAs when deciding to eat out. They were also asked to rank their DEVA preferences on a scale from 1 to 7. The most preferred DEVA was ranked as '1' and the least preferred was ranked as '7'.

The results from Surveys 1 and 2 were used to examine RP1 and RP5. The results covering the importance component (N = 410) were also used to assess the validity of the DEVAs using principal component analysis (PCA). The correlation matrix showed that all variables had at least one correlation coefficient greater than 0.3. The overall 'Kaiser-Meyer-Olkin' (KMO) measure was 0.767, with individual KMO measures all greater than 0.6. Bartlett's test of sphericity was statistically significant ($p < .0005$). PCA revealed seven components that had eigenvalues greater than 1, which explained 32.96%, 13.60%, 10.31%, 7.94%, 6.97%, 4.83% and 4.32% of the total variance, respectively. The seven-component solution explained 80.92% of the total variance. A varimax orthogonal rotation was employed and the interpretation of the data was consistent with the DEVAs the questionnaire was designed to measure.

- Survey 3 gathered data from (N = 9) management staff to inform management value attribute rankings. The management team's preference ranking of value attributes was based on the analytical hierarchy process (Vargas and Saaty, 2012). The ranking scale ranged from 1 (equal importance) to 9 (extreme importance). These results provided additional metrics that were used to examine RP5.

4.4. Data analysis

4.4.1. CDMA stage 1; RP1

From the Survey 1 data, weights for the DEVA preference rankings can be determined using the rank sum method of the Simple Multi Attribute Rating Technique Exploiting Ranks (SMARTER; Barron and Barrett, 1996).

Restaurant costs can then be defined based on the value creation model approach. This entails an in-depth analysis of all restaurant activities by observation of actual work practices. The process is based on the functional analysis systems technique that evolved from the value analysis/value engineering processes of the 1960s (Bytheway, 2007). Functional analysis using a consumer-orientated function analysis system technique (FAST) diagram allows the operation to inventory all its internal activities and then identify those attributes expected by both the customer and the business itself. It defines all of the functions specifically from the customer's/user's viewpoint and it also recognises

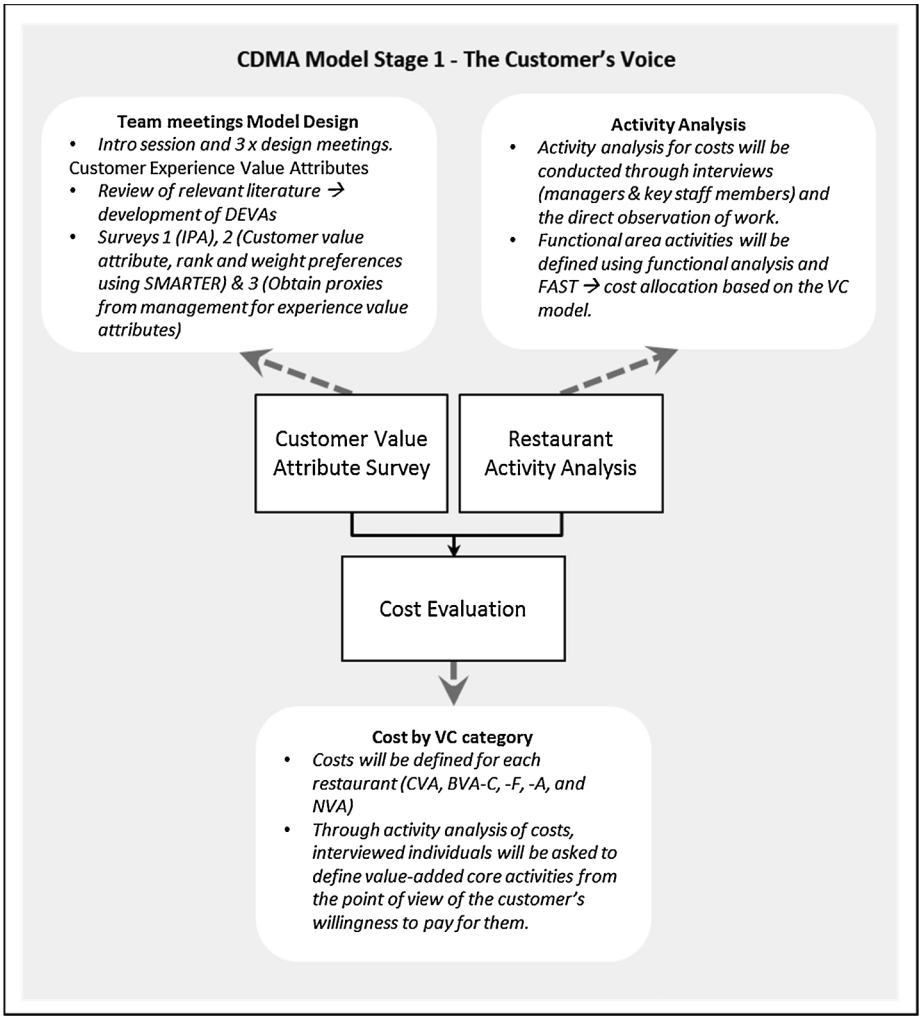

Fig. 3. Key elements of CDMA Stage 1 – The Customer's Voice (VC = value creation; CVA = customer value-added; BVA = business value-added; NVA = non-value-added).

that both basic and supporting functions have value (Salem-Mhamdia and Ghadhab, 2012). In a restaurant setting, these functions are classified into two types: external – *front of house* (FoH); and internal – *back of house* (BoH). FoH activities are seen by the customer and they often participate in the actual process and the service delivery. BoH activities on the other hand very rarely involve the customer in either the production or delivery. However, if the BoH activity is at any point linked to the service experience, they do have the ability to either directly or indirectly influence customer perceptions (Salem-Mhamdia and Ghadhab, 2012; Zeithaml et al., 2013).

4.4.2. CDMA stage 2; RP2 & RP3

Stage 2 of the process requires three sets of estimates: (1) time to perform the activity; (2) item sales data; and (3) overhead cost burden rates. The use of a resource capacity metric, time, as the primary cost driver, enables the data collected in stage 1 to be categorised as CVA, BVA (current, future, and administrative) and NVA, and hence allocated to menu items. When completed, the process generates a 'statement of costs' for each menu item.

4.4.3. CDMA stage 3; RP4

When CDMA model cost approaches are applied to the traditional matrix approaches, for example the Kasavana and Smith (1982) matrix model, the results are classified into four quadrants based on popularity and either PP or EBIT (dependent on the cost approach that was used). When the data is used for goal value analysis, the CDMA model extends the method to produce two separate results: PP goal value and EBIT goal value. When the goal value model is visually presented as a polygon in a two-dimensional space (Cohen et al., 2006, 1998), the larger the polygon, the better the dish is performing on the menu. The largest possible polygon indicates an ideal item (benchmark) and serves as a reference shape beside which other menu items can be evaluated. The menu analysis using DEA assesses the efficiency scores for each menu item. Both the PP and EBIT approaches can be applied using two

Table 1
Menu analysis (MA) – data envelopment analysis (DEA) input and output variables.

DEA approach	Input variables[a]	Output variables
Profit potential (PP)	Food cost, CVA-overhead cost	Popularity, revenue, PP
Earnings-before-interest-and-tax (EBIT)	CVA cost, BVA cost, NVA cost	Popularity, revenue, EBIT

[a] CVA = customer value-added; BVA = business value-added; NVA = non-value-added.

input variables and three output variables (Table 1).

Menu item efficiency scores can be compared using average scores ($\bar{X}$) (Fang and Hsu, 2014) or quartile analysis (Q) (Taylor, 2005). When the results are segmented based on mean average efficiency score rates, menu items with an efficiency score of '1' are deemed as 'desirable', 'less than 1 but greater than the mean' as 'improved', and 'less than the mean' as 'undesirable'. With quartile analysis, menu items are segmented into three groupings: top 25% categorised as 'Q_3'; the middle 50% categorised as 'Q_2'; and the lowest 25% categorised as 'Q_1'.

4.4.4. CDMA stage 4; RP5

To gain an in-depth understanding of the customer, the restaurant creates its own 'customer experience profile'. This profile includes the DEVAs and their respective values (identified from customer data collected in surveys). Revenue proxies are calculated, and the underlying cost structure of the restaurant is analysed. The revenue proxy represents the portion of customer value translated into total revenue earned by the restaurant. It is an excellent starting point for management to understand what the customer actually expects from the service bundle that they provide. Activities defined as 'CVA' are linked and matched with the DEVA(s) they support. Multipliers are developed, and their relationships are further analysed to identify functions and activities that provide an *above-average* contribution to customer value creation. The key focus is on the multiplicative relationship between the revenues earned by the CVA efforts and the resources used by the restaurant to achieve it. The ratio of value-added revenue to value-added cost reflects the notion that a high revenue and growth curve can be achieved by investing operational resources in activities that the customer values (Marceau, 2013; McNair-Connolly et al., 2013a).

5. Findings (implementation and testing of the CDMA model)

5.1. RP1 – the restaurant can identify costs that directly add value to the customer experience

Survey 1 (importance-performance analysis) measured the customers' perception of the seven DEVAs and identified those that were either under or over performing. The results are shown in Fig. 4.

The data from Survey 1 was also used to measure attribute-specific customer satisfaction and to calculate an overall customer satisfaction index (CSI) (Chu, 2002) for the restaurant (Table 2).

As can be seen, the overall CSI was a satisfactory 83.60%, calculated using the inputs of importance and performance scores. The most important customer value attribute was 'culinary experience' with a mean rating of 4.70 followed by 'atmospheric experience' and 'service experience', both achieving a rating of 4.67. 'People experience' was also scored highly at 4.24. These four DEVAs were also categorised as 'Keep Up The Good Work' (KUTGW) on the Importance-Performance Grid (Fig. 4). This same trend continued when the satisfaction level for each of the DEVAs was calculated. The CSI score for 'service experience' was the highest at 90.09% followed by 'culinary experience' (87.50%), 'people experience' (86.32%) and 'atmospheric experience' (84.02%). The remaining DEVAs were all categorised as 'Low Priority' (LP) with 'co-creation' scoring 3.94 out of 5 in terms of importance but a satisfactory CSI of 80.07%. 'Dietary experience' achieved a slightly lower importance score of 3.89 and a CSI of 78.69%. The lowest score related to 'online experience'. Customers did not feel this was an important attribute (3.30) and rated it as 68.69% (CSI). None of the attributes fell into the quadrants of 'Concentrate Here' (CH) or 'Possible Overkill' (PO).

Surveys 2 and 3 measured customers' and managements' perceptions of each of the DEVAs. Table 3 summarises the survey results and the corresponding rank order from both management (columns B & C) and the market (columns D, E, F & G). Column H lists the proportional allocation of CVA costs and the corresponding rank order (column I).

It is noteworthy that the management and market weights of the relative importance of some of the experience value attributes match each other closely, whereas others differ significantly, reflecting a possible disconnect between the two groups (Fig. 5).

The results highlight differences in the ways management (—) and customers (—) rated some of the DEVAs, the most notable relating to dietary and atmospheric experience. Atmospheric experience was rated 2.18 times more highly by customers, than by senior management. Viewed in isolation, this result could indicate a management

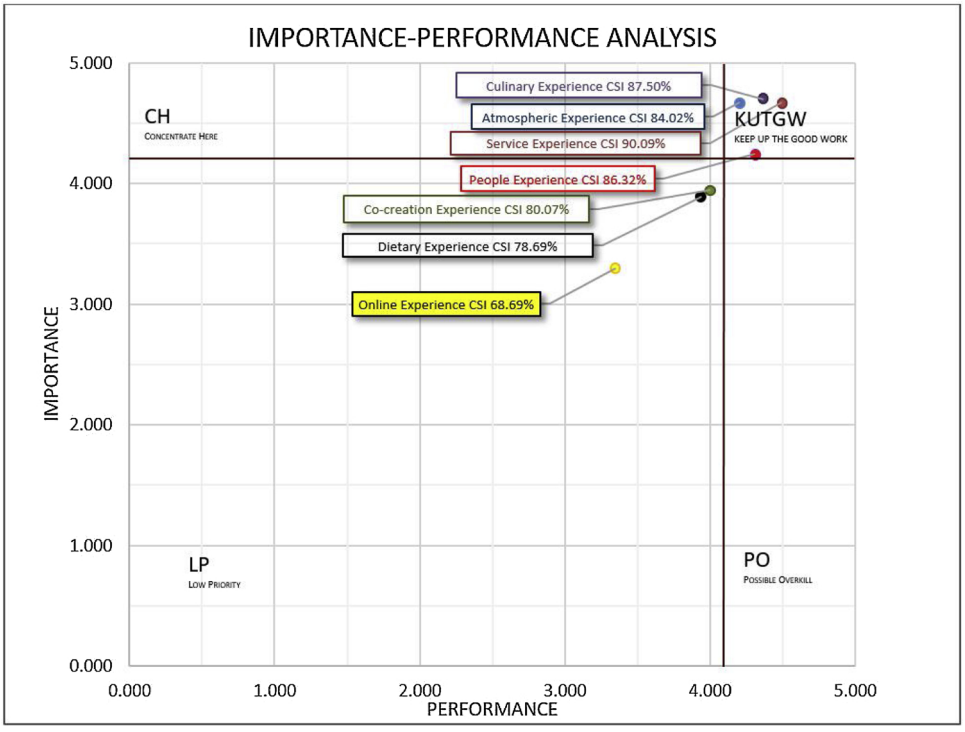

Fig. 4. Importance-performance grid showing customers' perceptions of the seven dining experience value attributes (DEVAs).

Table 2
Importance-performance analysis and customer satisfaction index (CSI) calculations for the seven dining experience value attributes (DEVAs).

DEVA	Importance (*I*)	Performance (*P*)	Importance × performance (*I* × *P*)	Attribute CSI (%)
Online experience	3.30	3.35	11.03	68.69
Atmospheric experience	4.67	4.20	19.63	84.02
Service experience	4.67	4.50	*20.99*	90.09
People experience	4.24	4.31	*18.29*	86.32
Culinary experience	4.70	4.37	*20.53*	87.50
Dietary experience	3.89	3.94	*15.35*	78.69
Co-creation experience	3.94	4.00	*15.77*	80.07
	Σ 132.25		**Σ 552.83**	

$CSI = \frac{\sum_{i=1}^{n}(I_i \times P_i)}{\sum_{i=1}^{n}(I_i \times R)} \times 100\%$ $CSI = \frac{552.83}{132.25 \times 5} \times 100\% = 83.60\%$

problem, but is not critical when viewed together with the high attribute CSI score (84.02%) and the importance-performance analysis score (19.63). However, the variance in the dietary experience scores (1.64), combined with the high score in cost (—) allocation (19.14% of CVA costs) and the second-lowest customer satisfaction score (78.69%), pointed to a possible disconnect between the vision and aims of the company as a whole, and those of the senior and local management teams.

Management rated 'people experience' as the third most important experience value attribute, with a weighting of 20.83%. However, customers rated it as the fourth most important, with a weighting of only 13.99%, and actual CVA spend was the fifth highest, with 10.62% of CVA costs directed towards 'people experience'. Analysis of customer data, combined with CVA expenditures, revealed that the CVA expenditures were not aligned with corresponding market weights. The restaurant was overspending on the delivery of 'culinary experience', 'dietary experience' and 'co-creation experience', and it was underspending on 'online experience' and 'atmospheric experience'.

The next step of the CDMA model was to gather activity-related data. This was to identify costs that directly added value to the customer experience (RP1); and to facilitate the examination of RP2, tracing costs to menu items, through activity analysis of functions. The use of FAST diagrams (Fig. 6) facilitated restaurant activity analysis (Salem-Mhamdia and Ghadhab, 2012), thus enabling detailed labour utilisation calculations (Table 4).

The data from the functional analysis were used to prepare data collection spreadsheets. A number of meetings took place with the two departmental managers to assign staff time to the various activities performed in each department. These figures were also validated by visits to the restaurant to check actual practice and by matching the figures with the actual labour hour totals for each department. During the period of this study (three months), these totalled 9,505.35 h for the restaurant part of the operation and 7345.50 h for the kitchen.

The restaurant's general ledger was then reconstructed, overhead costs were allocated to the functional areas of FoH and BoH, and overhead cost rates were calculated. This enabled cost allocation to the value creation categories of CVA, BVA current, future or administrative, and NVA (Table 5).

The final task was to categorise the dollar values of customer value-adding activities based on the seven DEVAs (Table 6).

These results clearly show that by building the customer perspective directly into each stage of the restaurant cost management system, it is possible to identify costs that add value to the customer experience. A point to note here is that the CDMA model is a cyclical process and after the completion of each round of analysis, management can refocus the restaurant's resources to ensure they more closely match customer preferences. This will ensure that the customer's voice is *always heard* and *never lost*.

5.2. RP2 & RP3 – the restaurant can trace costs to menu items through the activity analysis of functions & the restaurant can calculate the profit potential and EBIT of individual menu items

The detailed measurements relating to the preparation time for each dish were used with activity data collected earlier (Table 4) to assign costs directly to menu items using time-based equations. This resulted in a statement of costs for each menu item, and the data was subsequently used to produce individual 'income statements' showing the food cost and overhead-related costs.

Table 7 shows an example of the layout of the individual menu item income statements. It demonstrates that it *is* possible to trace costs to menu items in this way, as outlined in RP2. It also illustrates that once this process is completed, it is possible to calculate the 'profit potential' (PP) and 'earnings before interest and tax' (EBIT) of individual menu items (RP3).

This methodology, in contrast to traditional approaches, revealed marked differences in the actual profitability of each menu item. Analysis of the complete menu by category showed that when all the 32 menu items were rank-ordered based on 'dollar gross profit' and 'dollar profit potential', only 10 items produced the same ranking. Additionally, when the comparison was extended to 'dollar earnings before profit and tax', only 11 items produced the same ranking. A

Table 3
Value attributes, relative weights and customer satisfaction.

A DEVA[a]	B Management weight (%)	C Rank	D Market weight (%)	E Rank	F Customer satisfaction (%)	G Rank	H Cost allocation (%)	I Rank
Online	2.47	7	3.59	7	68.69	7	0.15	7
Atmospherics	8.51	5	18.51	3	84.02	4	6.97	6
Service	24.79	2	22.37	2	90.09	1	14.00	3
People	20.83	3	13.99	4	86.32	3	10.62	5
Culinary	25.42	1	25.91	1	87.50	2	38.30	1
Dietary	6.29	6	10.29	5	78.69	6	19.14	2
Co-creation	11.69	4	5.34	6	80.07	5	10.81	4

[a] DEVA = dining experience value attribute.

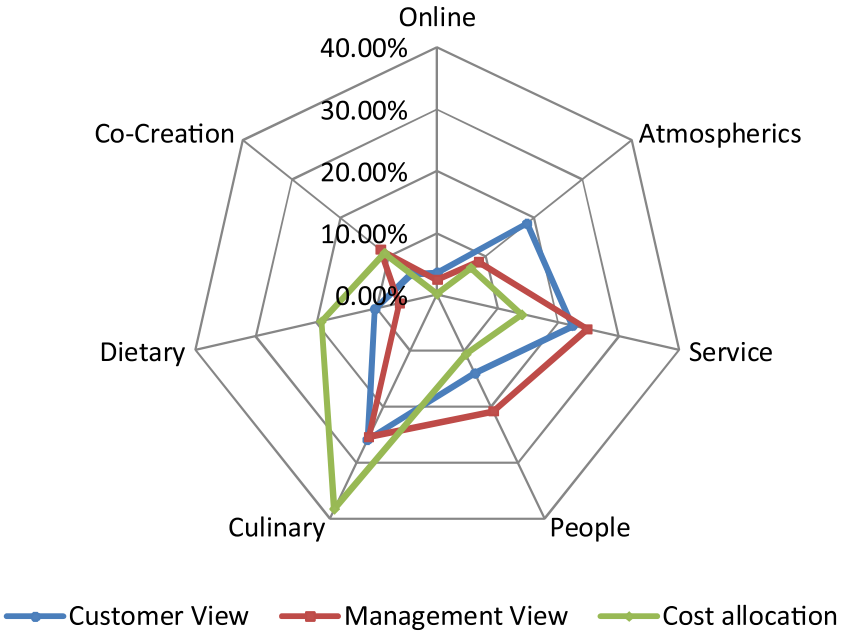

Fig. 5. Relative weightings and cost allocation.

similar trend was shown between rankings of gross profit percentage and PP percentage (18 differences), and between gross profit percentage and EBIT percentage (22 differences). This marked difference in profitability results demonstrates the importance of detailed and complete menu cost information (Raab et al., 2009).

5.3. RP4 – the restaurant can manage the menu offering effectively to improve its PP and EBIT, thus improving overall profitability

Using cost data from individual statements of cost for each menu item, the CDMA approach was applied to a number of menu analysis models and compared with three traditional matrix models. The performance of each of the MA models was analysed by removing the least desirable menu items and then calculating new revenue projections based on the readjusted distribution of item sales. The analysis was conducted using two methods: a conservative approach and an aggressive approach. With the conservative approach, a maximum of 20% of the lowest performing items could be removed from any menu category applying the matrix models. If more than 20% met this criterion, additional information on profit factor rankings were used to determine which items to remove. Quartile analysis was used under goal value analysis (GVA) and DEA approach to segment the menu into three groupings. Items that fell into Q1 were identified as poor performers and were removed. The 20% 'rule' was also applied to these items. With the aggressive approach, the matrix models removed all menu items that fell into the poorest performing quadrants. GVA and DEA removed dishes deemed 'undesirable', that is, those that fell below the mean. There was no limit on the number of items that could be removed at one time.

All menu items were classified separately for each product group (breakfast items, entrees, mains, sides and desserts). The final analysis used 'sales', 'menu cost' and EBIT as the financial performance indicators (Fang and Hsu, 2014). The EBIT of each of the methods was calculated based on the following formula:

$$\text{EBIT} = \sum_{i=1}^{N} SP_i \text{x Sold}_i - \sum_{i=1}^{N} FC_i \text{x Sold}_i - \sum_{i=1}^{N} CVAOH_i x \text{ Sold}_i - \sum_{i=1}^{N} BVA_i \text{x Sold}_i - \sum_{i=1}^{N} NVA_i x \text{ Sold}_i$$

where SP_i, FC_i, CVA_i, $CVAOH_i$, BVA_i NVA_i and Sold_i are defined as follows:

SP = selling price
FC = food cost
CVAOH = customer value-added overhead cost
BVA = business value-added overhead cost
NVA = non-value-added overhead cost
'Sold' = number of sales for the i^{th} menu item.

A summary of the results of the analysis are presented in Table 8.

The conservative approach with the 20% rule produced very similar results for each method. However, when the aggressive approach was applied, the results were dramatically different. Of the three traditional matrix approaches, CMAM produced the best result, with an increase in projected EBIT of 10.09%. However, the highest increase in EBIT was achieved when CDMA was applied to the goal value analysis approach. There was a forecasted increase of 19.85% with the EBIT approach and 17.40% with the PP approach. This was achieved by removing all of the items that were categorised as 'undesirable', which resulted in the removal of 19 menu items (59.37%). A comparison of the number of menu items recommended for removal highlights the differences between the conservative and the aggressive approach. It is clear that no establishment could remove close to 80% of menu items in one menu category, but it does identify action that management needs to consider to improve the performance of the operation.

The findings demonstrate that the inclusion of all cost information in the MA process does aid the effective and profitable management of the menu offering. Results of the analysis are in slight contrast to the findings by Taylor et al. (2009) in which the traditional ME model (MEM) yielded the best result (projected GP), followed closely by multifactor MA using DEA. However, Taylor's model compared the results in terms of 'projected gross profit', whereas this research analysed all of the results based on EBIT. Results from the application of the CDMA model complement the findings by both Raab and Mayer (2007) and Fang and Hsu (2014) that complete cost data is necessary for conducting menu profitability analyses. In addition, the CDMA approach extends both models by including detailed 'customer-driven' cost data for each menu item. The cost data is linked to DEVAs as well as to the five cost categories of CVA, BVA current, future or administrative, and NVA.

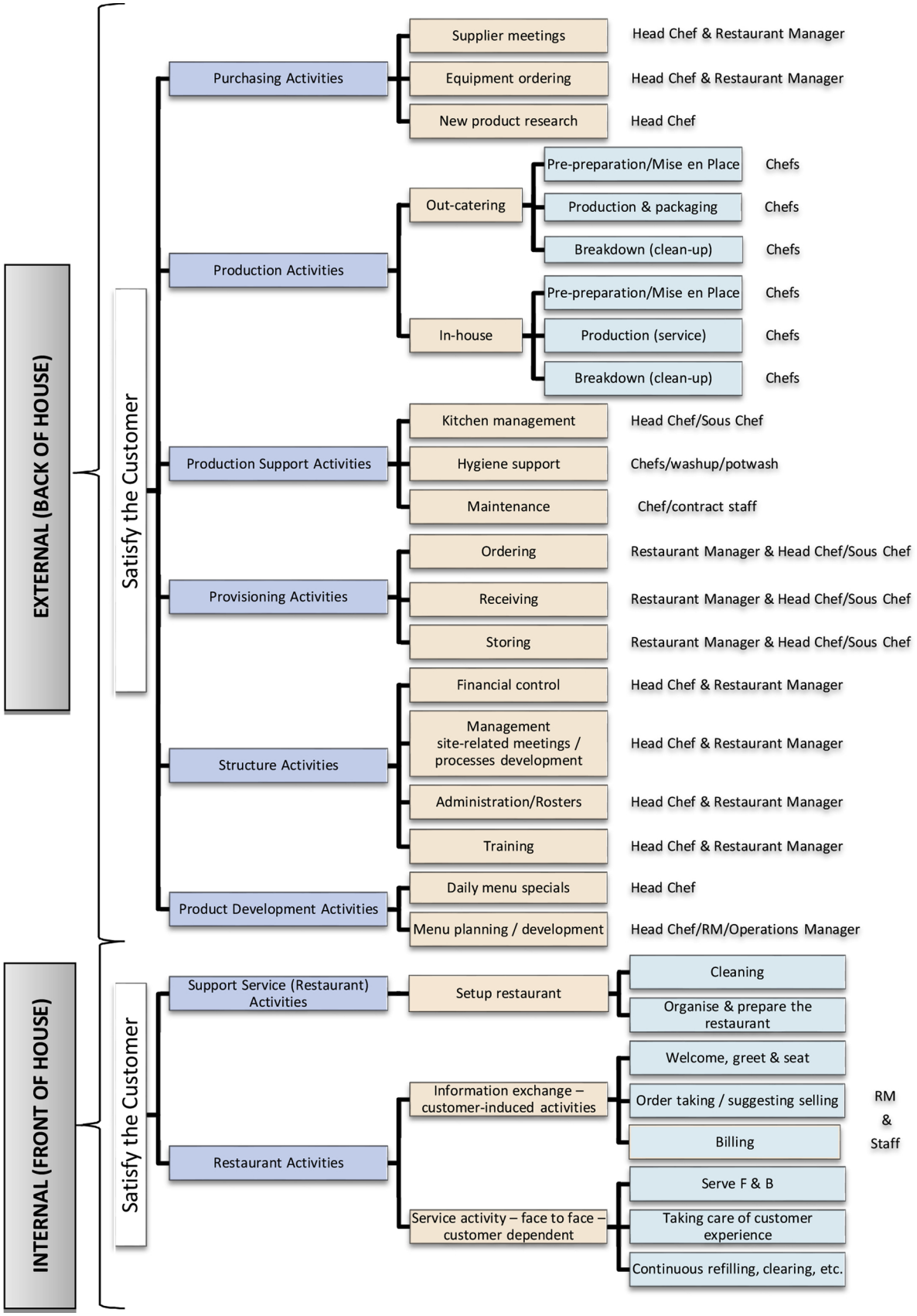

Fig. 6. Restaurant FAST diagram – functions/activities/tasks/responsibilities.

Table 4
Labour utilisation summary.

Activity description	'People' equivalent time	Number of hours for the period
Purchasing activities	0.13	67.43
Production activities	10.61	5,518.33
Production support activities	2.66	1,382.94
Provisioning activities	0.82	428.98
Structure activities	1.07	555.33
Product development	0.26	136.56
Support service activities	0.64	334.36
Restaurant activities	16.21	8,426.92
Totals	**32.40**	**16,850.85**

5.4. RP5 – the restaurant can disclose/identify inefficient use of resources; it could be possible to reduce NVA activities and waste

Using Survey 2 data, the actual restaurant revenue was compared to the value of DEVAs to produce revenue proxies that measure the alignment of the restaurant's efforts and expenditure with customer DEVA preferences (Table 9).

The second task was to analyse the spending of the restaurant in order to calculate value multipliers. Detailed restaurant spending was identified by matching the activities that management had defined as 'customer value-adding' with the seven DEVAs they supported. The resulting value multiplier, which was based on the customers' preference ratings (Survey 2), is a ratio that measures the revenue generated by each DEVA and compares it with the CVA dollars being spent by the restaurant to deliver each of the DEVAs. Low or negative multipliers are an indication of excessive spending, while high multipliers are a sign of either a competitive advantage or a value shortfall (McNair-Connolly et al., 2013a). The findings of this study produced results that complement these general principles. Three DEVAs were categorised as 'low multipliers' (< 2), three were categorised as 'intermediate' (between 2 and 5), and one was categorised as a 'high' (> 5) (Table 9).

The multipliers on their own, however, do not provide enough information; a number of other metrics were therefore included to facilitate an in-depth analysis and interpretation of the value multipliers (Table 9). These additional data (importance-performance analysis, importance-performance gap, CSI and management DEVA ratings) were gathered from Surveys 1 and 3.

5.4.1. Low multipliers

The bistro had three multipliers that fell into the low category. Two of the multipliers (dietary and co-creation) were below 1.000, indicating that the bistro was not breaking even on these two attributes, but rather was losing money by providing these attributes to the customers. When combined with customer satisfaction data, the relatively high spend of $103,738.09 (CVA costs) on dietary experience and $58,590.71 on co-creation experience was not having the desired effect in terms of customer satisfaction (rank 6 for dietary experience, and rank 5 for co-creation experience). However, the importance-performance (IP) grid results highlighted that both attributes had a 'low priority' rating. The culinary experience, which was ranked highest in importance by customers (25.91%), also had a high spend in CVA costs, which resulted in a low multiplier of 1.195. However, the satisfaction index was much healthier (ranked 2nd) and the IP grid rating was a positive 'keep up the good work'. For dietary experience and co-creation experience, the low multiplier suggested that the bistro was spending too much on resources to provide these specific experiences relative to the customers' willingness to pay for them. It is advisable, therefore, to evaluate all the costs associated with these attributes.

5.4.2. Intermediate multipliers

The bistro had three multipliers that fell into the intermediate category. Together with the IP grid results, which categorised all three as 'keep up the good work', these multipliers signalled a competitive advantage for the restaurant.

5.4.3. High multipliers

The online experience was the only CVA that achieved a high-value multiplier (42.602) and a positive IP gap of 0.05. However, this was an attribute that the customers did not value and any additional spending might not result in increased revenues. If management could increase the customers' perception of the importance of this attribute, additional spending on updating and improving the restaurant's online presence might be warranted and thus increase the low CSI of 68.69%. At the time of this research, customers did not seem to base their dining decision on the information presented on the bistro website.

6. Discussion and implications

Findings from the study offer key theoretical contributions to the literature and practical contributions to the restaurant industry.

6.1. Implications for theory

A recurring theme in current menu analysis methods is their focus on product, ignoring contextual variables. The CDMA model addresses contextual issues by including DEVAs as a key element in the MA process. Instead of viewing each menu item in isolation, they are treated as a representation of the seven DEVAs. In this way, the menu can be analysed with reference to the attributes (context) that influence a customer's value perceptions of the complete restaurant meal experience. As Hemmington (2007) so aptly noted, "customers do not buy food and drink, they buy meal experiences" (p. 749).

A key aim of the CDMA model development process was to build the customer perspective into each of the four stages. By integrating value-based cost management systems and experience accounting methodologies into the MA process, the CDMA model enables the identification

Table 5
Total activity cost allocation by value creation category.

Activity description	CVA	BVA-C	BVA-F	BVA-A	NVA	TOTAL
Purchasing activities	$0.00	$979.50	$422.26	$16.01	$242.91	$1660.68
Production activities	$85,416.60	$37,751.87	$51.67	$247.99	$12,445.89	$135,914.03
Production support activities	$422.64	$20,014.07	$0.00	$10,641.00	$2983.48	$34,061.18
Provisioning activities	$519.35	$6357.26	$0.00	$2653.68	$1035.37	$10,565.66
Structure activities	$3504.48	$2735.41	$2540.47	$3547.65	$1349.55	$13,677.55
Product development	$1111.89	$1753.43	$336.34	$8.00	$153.69	$3363.35
Support service activities	$3497.34	$4371.67	$0.00	$0.00	$874.33	$8743.35
Restaurant activities	$187,926.32	$0.00	$0.00	$3018.63	$29,414.85	$220,359.79
Totals	**$282,398.63**	**$73,963.22**	$3350.72	**$20,132.96**	**$48,500.07**	**$428,345.60**
Percent-of total costs	65.93%	17.27%	0.78%	4.70%	11.32%	100.00%

The algorithms used for Table 5 calculations have commercial value and are being used to develop a computerised version of the CDMA model. Limited explanations of calculations can be forwarded to the reader if required.

Table 6
Customer value-adding cost estimates by customer dining experience value attributes.

Activity-descriptions	ONLINE EXPERIENCE	ATMOSPHERIC EXPERIENCE	SERVICE EXPERIENCE	PEOPLE EXPERIENCE	CULINARY EXPERIENCE	DIETARY EXPERIENCE	CO-CREATING EXPERIENCE
Purchasing	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Production	$0.00	$17,083.32	$17,083.32	$0.00	$25,624.98	$25,624.98	$0.00
Production support	$0.00	$169.06	$169.06	$0.00	$0.00	$0.00	$84.53
Provisioning	$0.00	$51.94	$207.74	$0.00	$51.94	$51.94	$155.81
Structure	$695.44	$528.40	$878.85	$700.90	$0.00	$0.00	$700.90
Product development	$111.19	$111.19	$111.19	$111.19	$222.38	$222.38	$222.38
Support service	$0.00	$1049.20	$1049.20	$349.73	$0.00	$0.00	$1049.20
Restaurant	$0.00	$18,792.63	$56,377.90	$56,377.90	$0.00	$0.00	$56,377.90
Product cost					$181,623.86	$77,838.80	
TOTAL	$806.63	$37,785.74	$75,877.25	$57,539.72	$207,523.15	$103,738.09	$58,590.71
%Distribution	0.15%	6.97%	14.00%	10.62%	38.30%	19.14%	10.81%

The algorithms used for Table 6 calculations have commercial value and are being used to develop a computerised version of the CDMA model. Limited explanations of calculations can be forwarded to the reader if required.

Table 7
Individual menu item income statements.

	Wild-mushroom ragù		
	N = 692		
	Item	Total	%
Sales ex GST	$16.30	$11,285.51	100.0
Food cost	$2.65	$1834.50	16.3
Gross profit	$13.65	$9451.01	83.7
OH VA-costs	$5.23	$3617.42	32.1
Profit potential	$8.43	$5833.59	51.7
BVA costs	$2.25	$1559.40	13.8
Profit before NVA costs	$6.17	$4274.19	37.9
NVA costs	$0.87	$601.73	5.3
EBIT	$5.31	$3672.46	32.5

OH VA costs = Overhead-value-added costs.
BVA costs = Business-value-added costs.
NVA costs = Non-value-added costs.
EBIT = Earnings before interest and tax.

Table 8
Menu analysis comparison.

Model	Conservative approach		Aggressive approach	
	Projected EBIT	Increase % / (Decrease %)	Projected EBIT	Increase % / (Decrease %)
MAM	$220,122.51	2.84%	$220,122.51	2.84%
MEM	$218,669.58	2.16%	$223,336.75	4.34%
CMAM	$221,855.99	3.65%	$235,639.01	10.09%
PP-MEM	$219,929.41	2.75%	$224,596.59	4.93%
EBIT-MEM	$219,929.41	2.75%	$224,596.59	4.93%
PP-GV	$219,655.76	2.62%	$251,301.27	17.40%
PP-DEA	$218,908.84	2.27%	$235,864.68	10.19%
EBIT-GV	$218,891.03	2.26%	$256,544.88	19.85%
EBIT-DEA	①	①	①	①

① Not calculated because of negative data figures.
MAM (model by Miller, 1980). MEM (model by Kasavana and Smith, 1982). CMAM (model by Pavesic, 1985). PP-MEM and EBIT-MEM (CDMA applied to Kasavana and Smith, 1982 model). PP-GV and EBIT-GV (CDMA applied to Hayes and Huffman, 1985 model). PP-DEA and EBIT-DEA (CDMA using Data Envelopment Analysis).

of the functions, activities and tasks, and overcomes the shortcomings of other cost management techniques. An assessment of linkages between internal cost structures and externally defined value is facilitated with the CDMA model. Doing so is important because, as shown in the RP1 finding, managers are not always good judges of customers' value preferences and, at times, take a 'hands-off' view when evaluating the operation's value propositions (McNair et al., 2001a,b). This can often result in spending that does not match customers' willingness to pay.

The CDMA model overcomes the shortcomings of existing MA models by capturing the context in which the consumption experience occurs and allowing for possible interdependencies between menu items. This enhances the use of MA as a strategic-decision support tool for management. The results relating to RP4 demonstrate that the inclusion of all cost information in the MA process *does* aid the effective and profitable management of the menu offering. These results also complement the findings by both Raab et al. (2009) and Fang and Hsu (2014) that complete cost data is necessary for conducting menu profitability analyses. However, the key difference with CDMA is that it is the only method that includes detailed *customer-driven* cost data for each menu item. The model embeds the customer perspective at every stage of MA and demonstrates that the key element in any menu analysis is 'externally-defined value' (as defined by the customer).

6.2. Implications for practice

The implementation and testing of the CDMA model clearly demonstrated that attribute-based cost management systems can be successfully applied to the restaurant industry. The CDMA model is a comprehensive model that can be applied to several different MA methodologies. Thus, it provides restaurateurs with the freedom to choose the most suitable MA method for their business. This would be especially important for individual small to medium-sized enterprises (SMEs) given previous research highlighting the reluctance of SMEs to apply any formal MA methods in their daily operation (Jones and Mifli, 2001; Kwong, 2005; Nemeschansky, 2012).

By integrating value creation and experience accounting methodologies into the CDMA process, management can now have a different view of the operation – one that displays the cost structure in a more customer-focused way. Management can identify costs that 'directly touch the customer' (CVA), costs that 'indirectly support customer needs' (BVA-current), costs that 'allow time to be spent building future business' (BVA-future), costs that 'allow time to be spent supporting the business' (BVA-administrative) and costs that 'account for time wasted' (NVA). The CDMA approach also helps management to analyse costs in each of the functional areas (BoH and FoH) and then relate these costs to customer-defined value creation. The CDMA model also applies algorithms that allow 'what-if-analysis' to test the effects on overall performance when one or more of the variables in the model are changed.

The inclusion of the additional metrics facilitated a more in-depth analysis of the value multipliers at the restaurant. The low overall value multiplier of 1.766 (Table 9) was consistent with suggestions by McNair-Connolly et al. (2013a,b) that the more commoditised the market, the lower the overall multiplier would be. It is an indication of a cost-based operating strategy with inherent pressures on profit. The aim of multiplier analysis is to present data to management in a way that has a strategic perspective, thus enabling the operation to focus on

Table 9
Customer value attribute (CVA) data.

DEVA	Value attribute weighting (%)	Revenue proxy[a]		CVA cost per-attribute[b]		Value multiplier[b]		CSI[a] (%)		IP grid-result[c]	IP gap
Online	3.59	$34,364.02	B	$806.63	B	42.602	H	68.69	B	LP	0.05
Atmospherics	18.51	$177,110.01	A	$37,785.74	B	4.687	I	84.02	A	KUTGW	−0.47
Service	22.37	$214,079.40	T	$75,877.25	A	2.821	I	90.09	T	KUTGW	−0.17
People	13.99	$133,876.78	A	$57,539.72	A	2.327	I	86.32	A	KUTGW	0.07
Culinary	25.91	$247,921.07	T	$207,523.15	T	1.195	L	87.50	T	KUTGW	−0.33
Dietary	10.29	$98,490.16	A	$103,738.09	T	0.949	L	78.69	B	LP	0.05
Co-creation	5.34	$51,073.05	B	$58,590.71	A	0.872	L	80.07	A	LP	0.06
	100.00	$956,914.49		$541,861.28		**1.766**					

[a] T = top (the highest 25%); A = average (the middle 50%); B = bottom (the lowest 25%); CSI = customer satisfaction index.
[b] L = low multiplier (< 2); I = intermediate multiplier (between 2 & 5); H = high multiplier (> 5).
[c] IP = importance-performance; LP = low priority; KUTGW = keep up the good work.

improving its long-term performance. The analysis indicates where the restaurant is unable to deliver specific components of the DEVA profile, by spending either too much or too little, and thereby failing to maximise its resource use.

CDMA incorporates a comprehensive process document that will assist the application of the model to any restaurant operation. It provides detailed instructions on how to identify value-based operating costs and guidance on how to assign 'customer value-adding' costs to DEVAs. It can incorporate value-based cost information into a range of menu analysis models. With its extensive capture of all operating costs and their traceability, CDMA facilitates informed restaurant profitability analysis. The customer perspective is incrementally built into the CDMA system, as it is a cyclical process.

7. Limitations and directions for future research

There were some limitations to this study, which may provide avenues for further research. The study was based on research at only one restaurant in New Zealand's largest city, Auckland. Future research could expand model testing to other restaurants and other restaurant types. Comparative studies in other countries would also broaden the focus beyond New Zealand's cultural base.

The study was also exploratory research with limited generalisability. Because of time constraints, the actual fieldwork phase of the CRA process was completed over a relatively short period, which makes it difficult to evaluate relevance and especially the 'potential future relevance' of the new MA construct (Rautiainen et al., 2017).

The customer preferences were based on general DEVAs and therefore did not allow for a restaurant-specific approach, where the attributes would be determined by the actual customers of the restaurant. It would be interesting to apply the model using restaurant-specific value attributes and modify the CDMA model accordingly. In addition, the degree of 'willingness to pay' for each DEVA was assumed to be indicated by the customer survey results. It was not measured systematically (direct or indirect approach) as additional questions would have made the surveys both too long and too intrusive for customers.

Because of the cyclical nature of the CDMA process, testing could be extended so that it would be possible to measure how rapidly the customer perspective could be incorporated into the cost management system. This would also help measure the effects on both customer satisfaction and return intent, as well as restaurant profitability.

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