Exploring Business Intelligent Indexes of a Korean Style Theme Restaurant Taiwan

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EXPLORING BUSINESS INTELLIGENT INDEXES OF A KOREAN STYLE THEME RESTAURANT IN TAIWAN

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Abstract

Recently, the major development of food & beverage management information system had changed from the point-of-sale (POS) system for stand-alone restaurant to the combination of headquarter control mechanism and E-commerce operation strategy (also called chain-integration applications). Development of enterprise business intelligence (BI) becomes one of the strategic solutions as facing the complex competition business environment. The goal of this paper is to explore the business intelligent indexes of a Korean style theme restaurant in Taiwan and verify some of these indexes by analyze the business data of this restaurant. Four research methods will be used in this paper including literature analysis, site observation, case interview and business data analysis. This paper proposed 18 operation KPIs which are sorted out with Balanced Scorecard (BSC) concept for the target restaurant. The constraint business financial data at two months of this restaurant were used to verify the effectiveness of proposed KPIs. Results of this paper showed that the expected operation KPIs are effective and concentrate much more in the financial and customer dimensions.

Keywords: Theme Restaurant, Key Performance Index, Balanced Scorecard, Business Intelligent

Introduction

Recently, the customers paid more attention to the taste of foods and the atmosphere of restaurants gradually. Theme restaurants became one of the major developing attitudes of food and beverage industry in Taiwan. Theme restaurants used one or more historical elements or other special subjects to attract consumers. In addition to providing a basic food and beverage product and service, theme restaurants also emphasized the differences and cultural experiences. But as the demand market growing rapidly, theme restaurants looked forward to develop chain store operation model and enterprise information model.

When the theme restaurants began to expand chain store operation model, they needed to keep their original differences and cultural experiences firstly. Their food products and services also needed to maintain consistent quality. As the demand market growing rapidly, theme restaurants will face the difficulty that the traditional operation and management model can't match the customers' requirements and business scale developing without enterprising and technological operation methods. It is suggested that the restaurants should conduct food & beverage management information system to overcome this problems. They need to place more emphasis on the complete planning and performance promoting of commercial four flow, these are business flow, logistics flow, cash flow and information flow. Thus, the competition ability of restaurant can be promoted by supporting relative decision analysis suggestions from the business reporting data of information systems.

By the way, Business Intelligence (BI) system is one of the IT solutions for enterprise's selection about decision analysis. As mentioned in many literatures, BI is used to sum up the operation information from data warehouse of enterprise, and it converted the primary data into rich information for decision making. Therefore, as shown in Figure 1, chain restaurants can develop their BI systems through decision support system and data mining processes. After developing their BI systems, Figure 2 shows the operation flowchart that managers could transfer the complex and huge business data into useful information for making strategic decision by using their BI systems.

The cooperation real case, D Korean style theme restaurant, which is located at south of Taiwan is a subsidiary of C food and beverage chain group. D Restaurant was first established in Tainan 2001, and established Kaohsiung branch store in 2006 to begin their chain store operation model. The goal of this paper is to analyze the business data of this real case D restaurant and try to find the operation key performance indexes (KPIs) for developing the BI model of Taiwan theme restaurant, and understand the operation condition of D restaurant by these KPIs. In the future, results of this paper can expand developing experiences to other restaurants and help to enhance the competitiveness of food & beverage industry in Taiwan.
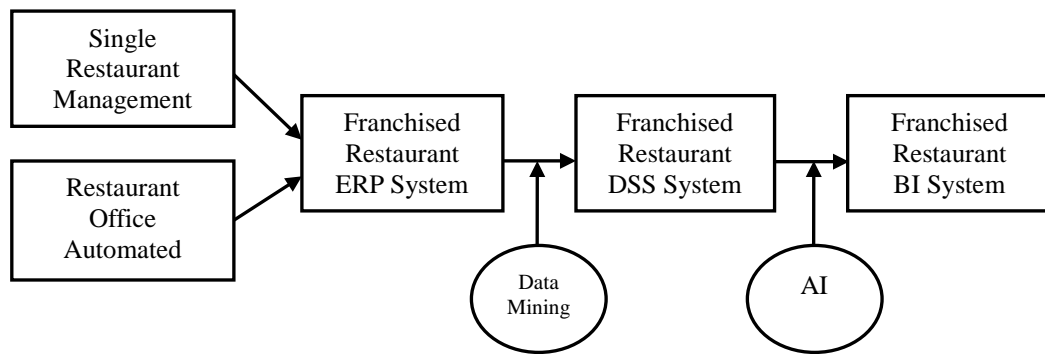
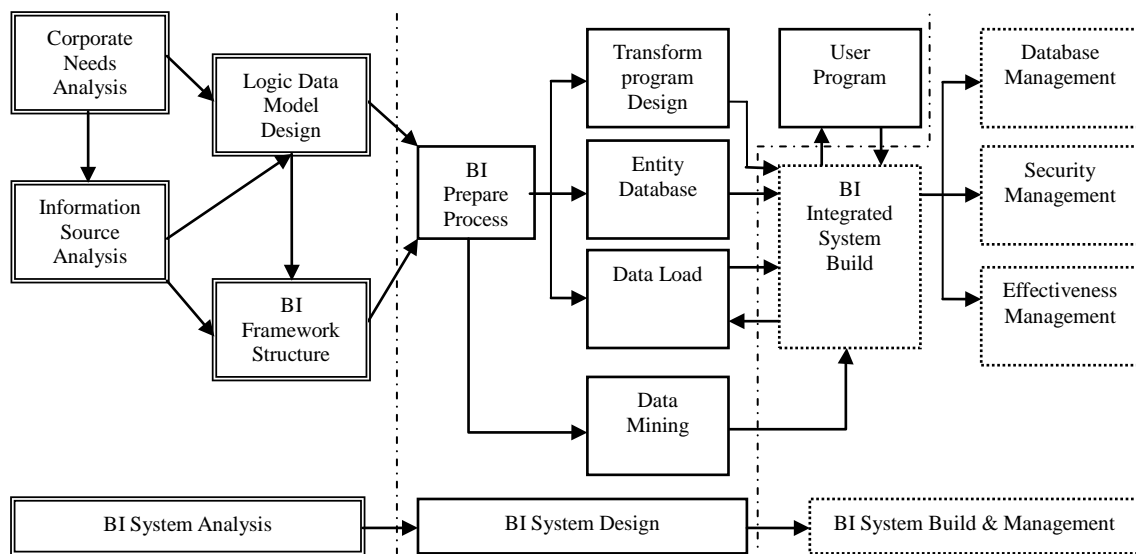Figure 1. Development flowchart of chain restaurant information

Figure 2. Business intelligent system development flowchart [11]

Literature Review

Balance scorecard (BSC) and key performance index (KPI) are two major concepts used in this paper. On the other hand, descriptions of the objective chain restaurant company and theme restaurant will be investigated below to understand their developing history, operating characteristics and the focus of management.

Case Descriptions

The C food and beverage chain group was established in 1991, now they have already owned 16 different restaurants in Taiwan. The chain group had several different style restaurants such as Cantonese restaurant, Korean restaurant, banquet hall, coffee shop, Italian restaurants, and Japanese restaurants. D Korean Restaurant was first established in Tainan 2001, exactly when the Korean soap opera was widely accepted in Taiwan to cause the popular of Korean cuisine. Therefore, the restaurant owner plans to develop D Korean restaurant with chain store

operation model.

In 2006, D restaurant established Kaohsiung branch store. The restaurant building has a traditional Korean style, and their foods are blended with modern innovation and traditional Korean cuisine. In addition, the restaurant provided traditional clothes and folk jewellery of Korean to take photo for the customers experience and purchase. The consumption method of D restaurant in Kaohsiung was buffet style (all you can eat by ordering), they provided customers with variety of Korean cuisine meals.

Balanced Scorecard

Balanced Scorecard (BSC) concept was introduced by Kaplan and Norton in 1992, they thought that BSC can help an enterprise to reach a vision and satisfy the expectation of shareholder. The main functions of BSC lied in converting mission and strategy of enterprise into overall measurement. The most important concept of BSC is to "balance". It is used to pursue the balance of short-term and

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long-term target, subjective and objective indexes, financial and non-financial measurements, backward and forward measurement indexes, internal and external performance dimensions, and individuals and organizations visions of enterprise [7].

BSC has four perspectives, included finance, customer, internal process and learning and growth perspectives. The main objective of BSC was to improve its financial performance of enterprises, strengthen the employee's learning growth, enhance the operation of internal side, and strengthen customer relationship [16]. Consequently, emphasized operation performance and profits of enterprise came from not only the data of financial report but also from other levels.

Balanced scorecard is a strategic management system which can judge the enterprise performance and pay strategy considerations through the characteristics and functions of the balanced scorecard. The goal of BSC is to achieve the vision and target of enterprise finally. The characteristics and functions of BSC are shown as follows [13]:

(1) Leading: to guide the budget of the organization, objectives and action plans.
(2) Problem judged system: to judge the enterprise strategic issues, strategic objectives, and measurement index in order to improve as reference.
(3) Causal relationship systems: because BSC four perspectives are interlocking each other, one can use these four perspectives to find sources of value creation in the enterprise.
(4) Variability system: BSC can change strategy in time with time and environmental change.
(5) Special communication system: BSC can develop enterprise for competitive differentiation.
(6) The synergy and integration of systems: BSC can combine and create synergy between the each business unit, connect synergy between the organization and personal, and integrate of the effectiveness of value management techniques.
(7) Problem summarized system: Establishing and analyzing the Balanced Scorecard experience problems can assist enterprises to avoid the trap of the implementation of the Balanced Scorecard.

Recently, many academic scholars used BSC concept as a research tools to evaluate the performances of target enterprise. This study tried to sort through the literatures of BSC research in recent years and found that there were many studies using the BSC to explore the performances of the organizations in the tourism and hospitality industries.

Huang, Chu & Wang [3] used BSC to develop the model of performance, and measure financial and non-financial side of performances in China hotel. Wu & Tsou [18] used the travel agency case as a research target and identified the causal relationship of each performance dimensions by structural equation modeling. Lee & Hsu [6] used fuzzy Delphi method and fuzzy analytical hierarchy process to integrate the expert views in related fields of business performance for the leisure farms. They found ways of increasing business performance of the key success factors and proposed ways to enhance the performance of the business strategy in the leisure farms. Peng & Lin [12] used the questionnaire survey method to collect cognitive opinions of tourism hotel directors, and they used BSC and analytical hierarchy process to measure performance of multiple dimensions in hospitality internships unit. The researchers tried to understand and solve the problems inside the performance of internships unit and the practice teaching.

Since there were many researches discussed about the BSC implementations in leisure and hotel industries which had conducted many useful results, the BSC implementation for restaurants were still empty and this study tried to explore the operation KPIs of theme restaurant through BSC. As shown in Figure 3, an integrated structure is constructed by combining a large framework of the BSC and a small framework of business functions. Since business functions which categorize the organization missions into different task are necessary basic functions for an enterprise to achieve the goals of survival and development. In this study, the business functions are divided into six categories as financial, marketing, production, research and development, human resource and, information management.
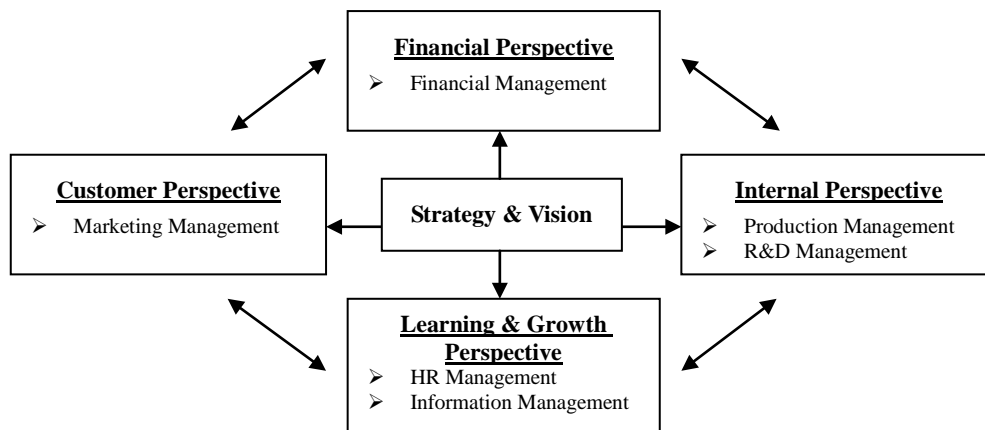
Figure 3. BSC and business functions integrated structure
(*Note.* Modified from [4])

Methodologies

Four research methods will be used in this paper including literature analysis, site observation, case interview and business data analysis. At the beginning, current situation analysis of C chain group and D theme restaurant was developed by case interview and non-interrupt site observation. On the other hand, the literature review analysis made up the initial 28 operation KPIs for developing BI model of theme restaurants. In addition, a structure questionnaire induced from the initial 28 operation KPIs was used to interview five senior managers of this chain group to find the requirements of target restaurant. Finally, this paper separated the suggesting operation KPIs into four meaningful clusters according to the concept of Balance Scorecard. At the final stage of this study, the best two and worst two months' business data of this D restaurant were used to verify the effectiveness of proposed operation KPIs. Based on the analysis of annual financial statements, there were six key indexes can be used to represent benefits and deficits of this D restaurant.

Results and Analysis

This section will show the results and discussions about the literature review, interviews, and verification of operation KPIs for D restaurant by its financial statements.

Key performance indexes (KPIs)

There were many researches conducting key performance indexes (KPIs) for business operation [1][2][5][8][10][9][14][15][17]. Base on analyzing these literatures, there were 96 important KPIs being taken into consideration firstly. As considering the characteristics and functions of this theme restaurant, this study chose 47 KPIs for the D restaurant through expert validity secondly. On the other hand, because the D restaurant did not induce complete food and beverage information system and ERP system, the collected operation data were inadequate to analyze

the KPIs of information. The 19 information KPIs would be left out. The number of proposed KPIs changed to 28. According to the separating features on Figure 3, the proposed 28 KPIs can be categorized by BSC as four groups and business functions as six groups. The categorization results are shown in Table 1 as follows.

Table 1. The proposed 47 KPIs categorized by BSC and business functions

BSC	Function	KPIs
Financial	Financial	1.Operation Revenue 2.Pretax Margin Ratio 3. Purchase Cost 4.Operating Costs Ratio 5.Cost-Effectiveness Ratio 6. Cost of Goods Sold Ratio 7.Turnover Grown Ratio
Customer	Marketing	8.Sales 9. Marketing Activities to Create Growth Rate 10. Customer Service Satisfaction 11. Customer Satisfaction with Food 12. Sales Forecast Accuracy Ratio 13. The Number of Customer Complaints 14. Sales Reached Analysis 15. The Expense of Management and Sale 16. Member Contribution Rate 17. Increase in the Number of New Members 18. Understanding of the Customer Needs
Internal	Production	19. Ingredients Scrap Rate 20. Employee Productivity 21. Inventory Money 22. Inventory Turnover in Days 23. Inventory Turnover in Times
Internal	R&D	24. Trace New Set Meal 25. Number of the R&D New Cuisine 26. The New Cuisine Ordering Rate
Learning & Growth	HR	27. Employee Training Fee 28. Employee Turnover

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The results of interviews analysis

Based on the above literature analysis, this paper found 28 key performance indexes that can be used for the D restaurant. In addition, these 28 operation KPIs was used to interview five senior managers of the D restaurant and this chain group to find the important and requirements of the D restaurant. They were manager and assistant GM of the D restaurant and the other 3 assistant GM of different chain restaurants in this chain group. The interviews were scheduled on December 22 and 23 2009. Two results of this interview would be conducted by analyze their answers. One was the important grades of these KPIs and the other was the necessary grades of these KPIs.

The importance grades of KPIs

The important degree of 28 KPIs will be given grade from one (very unimportant) to ten (very important) points by the 5 senior managers as their practical important recognition. The interview results of KPIs important grades are shown in Table 2. In order to separate importance grades effectively, three suggestion levels were used in this paper. The KPIs were set as moderate suggestion if their average grades are between 8.5 and 7.6 points. The KPIs were set as low and high suggestion if their average grades are below 7.5 point and above 8.6 point respectively. The results of proposed KPIs importance grades are shown in Table 2.

Table 2. The results of proposed KPIs importance grades

The Degree of Suggestion	KPIs
High: Above average of 8.6 points	1.Operation Revenue, 2.Pretax Margin Ratio, 3.Purchase Cost, 4.Operating Costs Ratio, 5.Cost-Effectiveness Ratio, 6.Cost of Goods Sold Ratio, 8.Sales
Moderate: Average of 7.6 to 8.5 points	7.Turnover Grown Ratio, 9.Marketing Activities to Create Growth Rate, 10.Customer Service Satisfaction, 11.Customer Satisfaction with Food, 19.Ingredients Scrap Rate, 21.Inventory Money, 22.Inventory Turnover in Days 23.Inventory Turnover in Times,
Low: Below average of 7.5 points	12.Sales Forecast Accuracy Ratio, 13.The Number of Customer Complaints, 14.Sales Reached Analysis, 15.The Expense of Management and Sale, 16.Member Contribution Rate, 17.Increase in the Number of New Members, 18.Understanding of the Customer Needs, 20.Employee Productivity, 24.Trace New Set Meal, 25.Number of the R&D New Cuisine, 26.The New Cuisine Ordering Rate, 27.Employee Training Fee, 28.Employee Turnover

Note: Importance was graded from 1 (very unimportant) to 10 (very important) points.

The requirement grades of KPIs

The 5 senior managers selected the necessary indexes independently from proposed 28 KPIs by their practical necessary recognition. The requirement grades were measured by the number of

checking times. The results will rank KPI with five times as the most requirements, with four times as the second requirement, and so on respectively. The results of proposed KPIs requirement grades are shown in Table 3. There were eight high necessary KPIs which reached 4 and 5 times grades and ten medium necessary KPIs which reached 3 times grades. The others KPIs which reached 2, 1, and 0 times grades were categorized as low necessary.

Table 3. The results of proposed KPIs requirement grades

Choice Times	KPIs
5	10.Customer Service Satisfaction
4	1.Operation Revenue, 2.Pretax Margin Ratio, 4.Operating Costs Ratio, 6.Cost of Goods Sold Ratio, 11.Customer Satisfaction with Food, 19.Ingredients Scrap Rate, 23.Inventory Turnover in Times
3	3.Purchase Cost, 5.Cost-Effectiveness Ratio, 7.Turnover Grown Ratio, 8.Sales, 9.Marketing Activities to Create Growth Rate, 12.Sales Forecast Accuracy Ratio, 13.The Number of Customer Complaints, 14.Sales Reached Analysis, 21.Inventory Money, 28.Employee Turnover
2	22.Inventory Turnover in Days
1	15.The Expense of Management and Sale, 16.Member Contribution Rate, 17.Increase in the Number of New Members, 18.Understanding of the Customer Needs, 20.Employee Productivity, 24.Trace New Set Meal, 26.The New Cuisine Ordering Rate, 27.Employee Training Fee
0	25.The Number of the R&D New Cuisine

Note: Requirement was measured the number of necessary selecting times, 5 times was the most requirement, 0 times was the least requirement.

Summary

According to the results of interviews, the operation KPIs denoted above moderate important or 3 grade requirement were chose as the necessary result indexes. By the way, this paper successfully selected the important and necessary 18 operation KPIs for the D theme restaurant and sorted out with Balanced Scorecard concept as shown in Table 4.

Table 4. Results of the important and necessary 18 KPIs Applicable to D Restaurant

BSC	Function	KPIs
Financial	Financial	1. Operation Revenue (High, 4) 2. Pretax Margin Ratio (High, 4) 6. Cost of Goods Sold Ratio (High, 4) 4. Operating Costs Ratio (High, 4) 5. Cost-Effectiveness Ratio (High, 3) 3. Purchase Cost (High, 3) 7. Turnover Grown Ratio (Moderate, 3)
Customer	Marketing	8. Sales (High, 3) 10. Customer Service Satisfaction (Moderate, 5) 11. Customer Satisfaction with Food (Moderate, 4) 9. Marketing Activities to Create Growth Rate (Moderate, 3) 12. Sales Forecast Accuracy Ratio (Low, 3) 14. Sales Reached Analysis (Low, 3)

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		13. The Number of Customer Complaints (Low, 3)
Internal	Production	19. Ingredients Scrap Rate (Moderate, 4) 23. Inventory Turnover in Times (Moderate, 4) 21. Inventory Money (Moderate, 3)
Learning & Growth	HR	28. Employee Turnover (Low, 3)

Analysis of operation financial data

In order to verify the effectiveness of these proposed KPIs, the data of operation financial statements were used to calculate values of KPIs and compare with each other. The D restaurant provides from July, 2008 to June, 2009 operation financial report data and this paper selected six feasible indexes of the financial dimensions for data mining analysis. The six feasible indexes were Operation Revenue, Pretax Margin Ratio, Cost of Goods Sold Ratio, Operating Costs Ratio, Cost-Effectiveness Ratio and, Turnover Grown Ratio. These six indexes were analyzed and calculated by picking out the highest pre-tax net income for two months (July & August) and the lowest (February & March) during this year. The analysis results are shown in Table 5.

The operation revenue of restaurant is higher to indicate that the operation performance of restaurant is better. Operation revenue performances in July and August were about one and a half times more than in February and March. The pretax margin ratio was used to indicate the profit ability of the enterprise management and be better with higher ratio. It was 6% and 7% in July and August, and in February and March were both about -20%.

Cost of goods sold ratio index was used to measure the cost of foods. In general, the food cost ratio maybe increase to 45% in the restaurant which is denominated in the number of customers and all you can eat [15]. The cost of goods sold ratio index in July and August were both less than 45% and up to 50% in February and March. Operating costs ratio index was used to measure enterprises operating costs including food costs and labor costs. In general, it is better no more than 75%. The ratios were near 66% in July and August, and higher than 78% in February and March.

Cost-effectiveness ratio was higher to indicate more profit as paying off a dollar. The ratios were higher than 6 and positive in July and August, while it was negative in February and March. Finally, turnover grown ratio was used to indicate the growth degree by comparing current and previous sales. It is positive in August for the enterprise growing up and is negative in February and March for the enterprise being decadent.

Table 5. The verified analysis results of six financial KPIs for D Restaurant

KPIs	Formula	2008/07	2008/08	2009/02	2009/03
Operation Revenue	Operation Revenue	3,250,000	3,440,000	2,380,000	2,270,000
Pretax Margin Ratio	Pretax Margin ÷ Net Sales × 100%	6.04%	7.45%	-19.71%	-19.94%
Cost of Goods Sold Ratio	Food Costs ÷ Operation Revenue × 100%	41.94%	43.09%	49.81%	49.61%
Operating Costs Ratio	Prime Costs* ÷ Operation Revenue × 100%	64.70%	66.13%	78.47%	81.18%
Cost-Effectiveness Ratio	Food Costs ÷ Pretax Margin	7.33	6.12	-2.76	-2.60
Turnover Grown Ratio	(Current－Previous) ÷Previous × 100%	--	5.71%	-28.89%	-4.71%

Note:* Prime Costs=Food Costs + Labor Costs

Conclusions and Suggestions

This paper had successfully conducted 18 operation KPIs for Taiwan theme restaurant to indicate the operation performances of target restaurant. The data of annual financial statements during 2009 had been used to calculate and verify the effectiveness of six proposed financial KPIs. The future study will focus on developing suitable business intelligent system model for the theme restaurant according to this 18 operation key performance indexes.

Since results of analytical key performance indexes matched current situations in the D restaurant as a necessary need. It is also represented that the expected operation key performance indexes of this restaurant are more concentrated in the financial and customer dimensions. Because the operation mode of this D theme restaurant was Korean-style cuisine buffet, the managers paid less emphasis on production and R&D management indexes of internal processes, and human resources management indexes of learning and growth.

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