Original Paper

KPI Design Method for Performance Appraisal of Media Advertising Company Based on Entropy Value Method

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Abstract

In order to optimize the performance appraisal system of the sales department of media advertising company, this paper takes company H as the research object, designs the KPI appraisal method for advertising sales personnel based on the current operation situation of the company, introduces the entropy value method to calculate the weight of each KPI index to ensure the objectivity and accuracy of the index, and provides reference for the scientific setting of the performance index of the sales department of media advertising company.

Keywords

KPI appraisal method, Entropy value method, Human resource management,

1. Introduction

In the early 1980s, China's advertising industry really began to develop. As an important part of the advertising industry, the revenue status of advertising companies has always been a barometer of economic development, and the good or bad of the advertising market also reflects the attitude of capital to the current market. After more than a decade of advertising business practice, the field of advertising activities in China has gradually formed the current situation of advertising agencies with the characteristics of China's reality. Nowadays, media-based advertising companies have occupied half of the market, which mainly make profits by renting media space and publishing agents, matching the most suitable media mix according to customers' budgets, providing media strategies and advertising implementation plans and executing them, and finally tracking, testing and evaluating advertising effects as the overall business process. The sales department is at the core of the whole business process, which fully realizes the market value of media products, drives other departments to carry out business, controls the front demand dynamics in real time, reflects first-hand market information, and drives the operation and development of the whole company. Therefore, the human

resource management of advertising company sales staff is very important, and a perfect and effective comprehensive performance evaluation system is an important means for advertising agencies to manage their staff, which also determines whether the long-term development of advertising agencies.

At present, many media advertising companies have not been able to establish their scientific and objective performance appraisal system, due to the wide range of business nature, the difficulty of quantifying performance appraisal, and the lack of awareness of the importance of employee performance appraisal, all of which make it impossible to show the work results clearly and accurately, and difficult to achieve procedural and standardization. Experts such as Sunfeng Li, VEENDIRKS, Haihang Zheng, Jun Su and Ning Yang concluded after enterprise case study analysis that enterprises should develop corresponding KPI indicators according to their own characteristics and development needs. Therefore, KPI of advertising media sales department, as an indicator to measure the work performance of sales staff, needs to measure KPIs based on the strategic objectives of advertising companies and further refinement and development of the company's strategic objectives. KPI is the discovery of the specific factors that really drive the company's strategic goals, and is the specific embodiment of the company's strategy for each position's job performance requirements. Therefore, as the core part of the advertising company's sales staff, it is all the more necessary to reflect the work results through key performance indicators, with scientific weighting comprehensive assessment, so as to highlight the value of work, optimize the human resources management of the sales department, and is also the basic requirement to achieve the company's strategic goals.

Therefore, this paper takes media advertising company H as the research object, based on the current situation of the company's business development, and designs an objective and reasonable KPI assessment method for advertising sales staff design to present the performance completion of media advertising company sales staff. The entropy value method is introduced to design the weights of the KPI indicators for sales personnel. Cheng Sen analyzed the rationality that the entropy value method can eliminate the subjectivity of the weights of each factor as much as possible, making the KPI system more objective and practical. Therefore, based on the entropy value method to calculate the weight of each KPI index of advertising company sales staff, the corresponding weight design method is proposed to calculate specific KPI indexes, and real-time dynamic weighting is realized by using the entropy value method, thus ensuring the rationality and objectivity of KPI formulation for media advertising company sales staff. It provides a theoretical basis for H advertising company to optimize the performance assessment system of advertising sales personnel, and also provides a reference for the scientific formulation of performance indicators for front-line business personnel in the media advertising industry.

2. Overview

2.1 Principles of KPI Appraisal Index Design for Media Advertising Companies

Media advertising companies conduct performance management for sales staff and follow the principle of efficiency first, take into account the principle of fairness and follow the principle of comprehensiveness and objectivity in the process of establishing the staff performance evaluation index system. The principle of efficiency first means always taking the work completion of the individual subject of assessment as the key, and formulating the job content around sales performance, customer maintenance, operation management, etc.; taking into account the principle of fairness, insisting on the fairness and openness of the assessment process, so as to strengthen the supervision of the whole process management and improve the work enthusiasm of employees; following the principle of comprehensive and objective, the assessment scope covers all work processes, reflecting the work in a factual and realistic manner, and the data feedback is objective and true. The results and data feedback are objective and true.

2.1.1 Overview of Media Advertising H Company

Media advertising H company was formally established in 2017, with 33 employees in the year of establishment, mainly operating in signboard advertising, road gate advertising, light box media, etc. After its own continuous development, the company's assets and operating income have reached a certain scale, and its business income reached 20 million yuan in 2018, with a profit of 11 million yuan. The number of sales points of signboards is 4051, occupying 89% of the number of media and 69% of the performance sources; the number of sales points of road gates is 163, accounting for 4% of the number of media and 19% of the performance, which is the highest publication rate of H The number of sales points of light boxes occupies 7% of the number of media, and the sales performance accounts for 8% of the media center; with 185 project media advertising operation rights, the initial formation of media network operation pattern, with strong media network operation ability, advertising planning and design ability and marketing ability, for hundreds of well-known brand customers to provide professional advertising services, customers involved in real estate, communications, supermarkets, automotive It has become the largest media advertising company with high-end media in western China.

3. Construction of KPI Assessment System for Media Advertising H Company

The extended development of KPI comes from the "Law of 28", which states that only 20 percent of the key factors in a particular organization will have an impact on the organization's operation, while the other 80 percent of the elements can only play a small role in the organization's operation. Therefore, the assessment content is based on the company's macroeconomic strategic goals based on the decomposition of a few key indicators, and then split from high to low, the more detailed the implementation process, the greater the number of indicators. Therefore, the KPI formulation of media advertising company H should reflect the effect of strategy implementation, serve the company's

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strategy in the whole process, combine the integration of individual goals and organizational goals, and ensure the consistency and correctness of the strategic path, so as to achieve the company's strategic goals.

The strategic goal of Company H in 2020 is "Reach 30 million", always uphold the "goal first, strive for excellence" to develop advertising business, adhere to wholeheartedly provide customers with the highest quality advertising services, with the smallest investment to obtain the maximum advertising value. Under the guidance of annual strategic objectives, the Sales Department of H Company organizes and implements annual sales plans, formulates media bidding sales plans and implements them; in the course of business, it is responsible for the signing, execution and management of sales contracts; reviews advertising screen monitoring reports; sends advertising release confirmations to customers, declares customer declaration processes and handles industrial and commercial approval procedures; manages the company's customer resources and customer relationships, and tracks the receivables of advertising sales contracts in real time. The collection of accounts receivable for advertising sales contracts, propose solutions for customers with significant risk in performance capability, and provide the company with market feedback and media sales analysis reports on a regular basis. Based on the actual business operation, the organizational structure of Company H and the factors affecting the target were analyzed and a fishbone diagram of the KPI strategic path of Company H's sales department was drawn. As shown in the Figure.
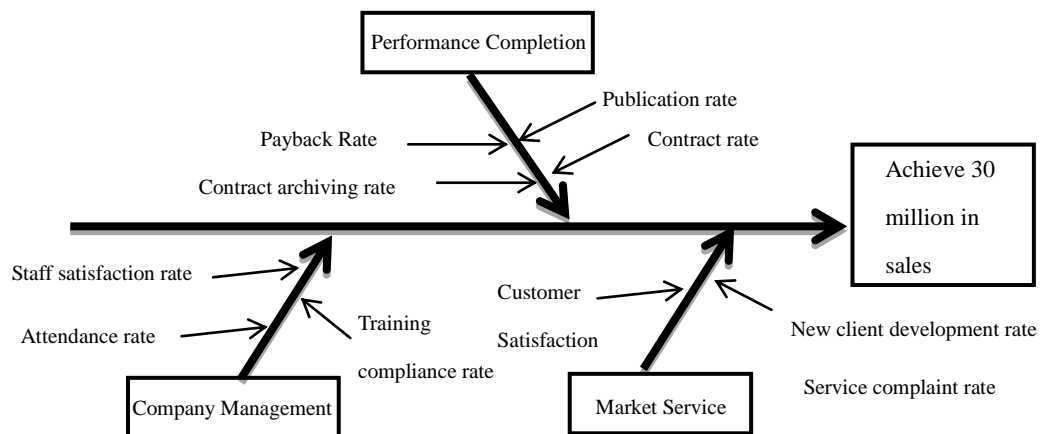

Figure 1. Fishbone Diagram of Key Indicators KPI

Sales staff as the key human resources to create business profits of H company, its main job responsibility is to create performance profits, economic benefits, so the performance assessment is the core index. According to the job assignment and work content arrangement, sales staff must obey the overall arrangement and management of the company, in order to fully mobilize the enthusiasm of the work, more fully personal value, improve the work of centripetal force, enhance the cohesion of the work team, so the staff management situation is also particularly important. In addition, staff as the

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company's external image of the business card, sales staff behavior attitude will also have an important impact on the company's long-term brand benefits, and the completion of sales staff performance and its behavior attitude is also closely related, so the behavior assessment should be considered a key indicator of the sales staff assessment. Therefore, the selection of KPI indicators for sales staff of H company, based on strategic orientation, is mainly selected from two aspects of performance assessment and behavioral assessment, and combined with quantitative and qualitative level analysis, quantitative assessment from sales job-related KPI performance assessment, including the contract rate, publication rate, return rate, contract filing rate, tracking the completion of sales staff work; qualitative performance assessment of the two The two key indicators of qualitative performance appraisal are oriented to the market and the company's internal team, the market performance is customer satisfaction, new customer development rate, and service complaint rate; the internal management of the company is reflected in employee satisfaction, training assessment rate, and attendance rate. Among them, the service complaint rate is a negative indicator, while the rest are positive indicators.

Therefore, the indicators for KPI performance assessment of advertising sales staff of Company H are shown in Table 1.

Table 1. Company H KPI Performance Appraisal key Indicators

Primary indicator	Secondary indicators/%
Performance Completion	Contract rate
	Publication rate
	Payback Rate
	Contract archiving rate
Primary indicator	Secondary indicators/%
	Customer Satisfaction
Market Service	New client development rate
	Service complaint rate
Primary indicator	Secondary indicators/%
	Training compliance rate
Company Management	Staff satisfaction rate
	Attendance rate

4. Design of KPI Indicators and Weights for Company H Using the Entropy Value Method

Entropy is a method to measure the degree of system chaos: according to the concept of information entropy, the dispersion of an index can be measured by the entropy value, the lower its information entropy, the greater the dispersion of the index, and the greater its influence on the weights. Using the entropy value method to determine the weights can eliminate the interference of human factors and

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make the evaluation more scientific and reasonable. Therefore, the information entropy can be used to determine the weights of each index, so as to lay the foundation for the scientific and comprehensive evaluation of multiple indexes. Based on the actual operation data, the information entropy of each index observation is calculated by the entropy method, and the weight of the index is determined according to the influence of the relative change degree of the index on the system as a whole. The specific steps are as follows:

Step 1: The "n" evaluation indicators in the "m" samples are arranged in order into the original data matrix $X = (X_{ij})_{m \times n} (1 \leq i \leq m, 1 \leq j \leq n)$, and X_{ij} is the jth indicator in the i-th sample. To determine the weight of each KPI indicator of Company H, therefore, the study monitored the data of Company H's operation during April-August 2018.

Step 2: Dimensionless processing. The extreme value processing method with optimal processing effect was used to dimensionlessize the data to make them comparable.

Positive indicators, such that:

$$x'_{ij} = \frac{x_{ij} - \min\{x_{ij}\}}{\max\{x_{ij}\} - \min\{x_{ij}\}} (i = 1, 2, \cdots, m; j = 1, 2, \cdots, n)$$

Negative indicators, such that:

$$x'_{ij} = \frac{\max\{x_{ij}\} - x_{ij}}{\max\{x_{ij}\} - \min\{x_{ij}\}} (i = 1, 2, \cdots, m; j = 1, 2, \cdots, n)$$

The calculated results of the dimensionless processing of the data related to the operations of Company H from April-August 2018 are shown in Table 2.

Table 2. Results of Dimensionless Processing of KPI of Company H

Primary indicator	Secondary indicators/%	April	May	June	July	August
Performance Completion	Contract rate	0.0001	0.1819	0.4546	1.0001	0.4092
	Publication rate	0.0001	1.0001	0.5557	0.1112	1.0001
	Payback Rate	0.0679	0.4577	0.2035	0.0001	1.0001
	Contract archiving rate	0.0001	0.0834	0.5834	0.3334	0.0001
Market Service	Customer Satisfaction	0.7098	1.0001	0.3549	0.0001	0.8066
	New client development rate	0.6254	1.0001	0.5885	0.2903	0.0001
	Service complaint rate	0.8987	0.5740	1.0001	0.5218	0.0001
Company Management	Training compliance rate	0.0001	0.1001	0.5001	0.9001	1.0001
	Staff satisfaction rate	0.7858	1.0001	0.0715	0.3572	0.0001
	Attendance rate	0.6668	0.3334	0.0001	1.0001	1.0001

Step 3: Calculate the weight matrix of the index system.

$$\left(\mathrm{p}_{ij}\right)_{\mathrm{m}\times\mathrm{n}} = \frac{x'_{ij}}{\sum\limits_{j=1}^{m} x'_{ij}}\left(j=1,2,\cdots,n\right) \text{, } 0 \le p_{ij} \le 1.$$

The results of the weight matrix calculated after dimensionless processing of the data related to the operations of Company H for April-August 2018 are shown in Table 3.

Table 3. Results of Dimensionless Processing of KPI of Company H

Primary indicator	Secondary indicators/%	April	May	June	July	August
Performance Completion	Contract rate	4.888	8.892	2.222	4.888	2.000
	Publication rate	3.749	3.750	2.083	4.170	3.750
	Payback Rate	3.926	2.647	1.177	5.783	5.783
	Contract archiving rate	9.995	8.339	5.831	3.333	9.995
Market Service	Customer Satisfaction	2.472	3.483	1.236	3.483	2.809
	New client development rate	2.497	3.993	2.350	1.159	3.993
	Service complaint rate	3.001	1.917	3.340	1.743	3.339
Company Management	Training compliance rate	3.999	4.003	2.000	3.600	4.000
	Staff satisfaction rate	3.548	4.516	3.230	1.613	4.515
	Attendance rate	2.222	1.111	3.333	3.333	3.333

Step 4: Calculate the entropy value of each weight.

$$e_j = -k\sum_{i=1}^{m}\left(p_{ij}\ln p_{ij}\right), i=1,2,\cdots,\mathrm{m} \text{ , } \mathrm{k}=\frac{1}{\ln\mathrm{m}}, 0 \le \mathrm{e}_j \le 1$$

In the entropy calculation, the current data does not appear to be $\mathrm{p}_{ij}=0$ and does not affect the row logarithm calculation.

Step 5: Calculate the information utility value.

$$d_j = 1 - \mathrm{e}_j (\mathrm{j}=1,2,\cdots\mathrm{n})$$

Step 6: Calculate the index weights.

$$w_j = \frac{d_j}{\sum\limits_{j=1}^{n} d_j}\left(j=1,2,\cdots,n\right) \text{, } \sum_{j=1}^{n} w_j = 1.$$

The entropy value e, utility value d_j, and weight w of each KPI index are calculated by steps 3, 4, and 5, and the calculation results are shown in Table 4:

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Table 4. KPI Index Weights of Company H

Primary indicator	Secondary indicators/%	w	d_{j}	e
Performance Completion 50.44%	Contract rate	0.0938871	0.240933388	0.7590666
	Publication rate	0.1002761	0.257328952	0.7426710
	Payback Rate	0.1359361	0.348839625	0.6511604
	Contract archiving rate	0.1742637	0.447195957	0.5528040
Market Service 20.52%	Customer Satisfaction	0.0680779	0.174701686	0.8252983
	New client development rate	0.0740612	0.190056196	0.8099438
	Service complaint rate	0.0630772	0.161868789	0.8381312
Company Management 29.04%	Training compliance rate	0.1026613	0.263449699	0.7365503
	Staff satisfaction rate	0.1155345	0.296485112	0.7035149
	Attendance rate	0.0722249	0.185343696	0.8146563

Relying on the orderliness of statistical data, we calculated the weight of performance completion of Company H as 50.44%, the weight of marketing services as 20.52%, and the weight of company management as 29.04%. Through the quantitative analysis of performance indicators, it strongly illustrates that the performance of advertising sales staff is still mainly based on the performance completion, and the customer development of sales staff is measured from the advertising contract, and the advertising execution of customers is evaluated from the degree of advertising publication, and the payback is closely related to the performance completion, so the payback still occupies a large proportion, and whether it can be classified as performance also depends on the contract filing. The situation, so the contract filing rate into the assessment, so the performance completion of the proportion of 50.44%; in the market service sales staff work ability to reflect, based on customer satisfaction, customer development rate, service complaint rate of the two accounted for a relatively average, so the comprehensive weight of the market service is 20.52%; company management, attendance is an important indicator to measure the work awareness and attitude, daily training Basic assessment is the exact situation of the degree of quality of human resources, but also to obtain data on the promotion and development potential of employees, more reflective of whether to identify with the company's management, other employees' satisfaction with this also determines whether the work can be smoothly seen in the exhibition, accounting for a relatively large proportion, after calculating the weight of the comprehensive index of company management is 29.04%.

Through the entropy value method based on the actual operating data of H advertising company to the company's advertising sales staff performance assessment KPI recalculation, get rid of the injustice brought by purely and simply looking at the total sales assessment, and more effectively identify the degree of achievement of each index and achievement differences among sales staff; avoid the

subjective behavior of managers to assess the identified behavior, through the analysis of differences, more targeted to improve the performance of each sales Through differential analysis, we can improve the performance of each salesperson in a more targeted manner, optimize and improve the work of future salespeople, and make the performance appraisal more than just a formality.

5. Discussion

This paper adopts the entropy value method to design a reliable and perfect assessment system for the performance kpi of sales staff in advertising companies, taking H advertising company as an example. The comprehensive use of objective and scientific weight determination methods and dynamic assignment of weights will make the evaluation results more accurate and objective, clearly show the highlights and shortcomings of employees' work, grasp the level of employees' career development, and provide reference for further development of employees' careers in planning, management and other decision-making will play a positive role in promoting; it is more operable, the evaluation results are easy to reach agreement, and employees are more satisfied with the objectivity and fairness of the evaluation results. Generally recognized, more adaptable to the needs of changing business conditions. On the one hand, it has a very important guiding role for the sales department and every employee to have a deeper understanding of the job responsibilities of the advertising company, to quantify the objectives and tasks, and to maintain a high degree of consistency with the strategic business objectives of the enterprise. On the other hand, the optimization and improvement of performance appraisal program is an inevitable requirement of enterprise refinement management, which is of great practical significance for advertising companies to improve their overall management level. Further research is needed to solve the problem that performance appraisal will increase the ability requirements for managers and will put forward higher requirements for employees' work, so as to better promote the common development of enterprises and employees.

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