

# Performance Evaluation of Enterprise Virtual Operation Based on Management Accounting Indicators

Mingliang Yu

Public Experiment Center  
University of Shanghai for Science and Technology  
Shanghai, China 200093

Lin Huang

Business School  
University of Shanghai for Science and Technology  
Shanghai, China 200093

Yushi Li

Business School  
University of Shanghai for Science and Technology  
Shanghai, China 200093

**Abstract**—This paper summarizes a scientific and effective ERP financial statement evaluation system on the basis of management accounting methods and relevant video courses. This system arranges these complex data and tables according to certain rules, and presents the complicated data language intuitively and accurately to the public. Therefore in a simple and understandable way, users can make accurate and reliable judgments quickly, which plays a positive role in the intensity of ERP competition and the promotion of enterprise virtual operation.

**Keywords**—*enterprise virtual operation; management accounting; evaluation system*

## I. INTRODUCTION

Enterprise virtual operation software, a kind of enterprise teaching software, which is relatively popular, relatively mature and has a long duration on the market at present. By simulating the production process of simple manufacturing enterprises, the software enables participants to experience the true feelings of enterprise managers before actually running the enterprise, and improves participants' overall grasp of the enterprise through simulating the operation. Wang Ying et al. [1] believe that one of the goals of ERP is to impart and apply knowledge of economic management related to simulated enterprise operation through practical teaching.

In recent years, in order to improve the connection between the education sector and the industrial and commercial sectors and improve the overall quality of college students, the course of enterprise virtual operation has been gradually introduced to the university campus. Due to the ever-changing virtual operation system of enterprise, operators should have at least the following characteristics in actual operation:

- Many kinds of enterprise virtual operation software covers all disciplines of economic and management experimental teaching, which requires the operators to have a knowledge of all disciplines and fields in order to gain a favorable position in the competition of enterprise virtual operation.
- The internal information of enterprise virtual operation is so numerous that the operators need to coordinate the information in all fields and make the best and most correct judgment in a short time.
- The core of ERP is information sharing, while the operating core of enterprise virtual operation software is financial information, which guides the joint operation of various kind of information. Therefore, the grasp of financial information is the general direction of the virtual operation system of the whole enterprise.

## II. ENTERPRISE VIRTUAL OPERATION TABLE

The financial data of the current year will be displayed in the form of annual report at the end of the year for enterprise virtual operation competition, including comprehensive expense statement, income statement and balance sheet. All the data shown in the annual report is the majority of the things that participate in the enterprise virtual operation competition, and the system then digitizes them for the sake of simplicity. If you can send these digital information digitization, translate them into understandable Chinese characters or graphics at ordinary times, so can not only to the enterprise virtual operations, making it easier for friends don't know, still can use convenient, concise, intuitive feeling originally complicated financial language, to better develop excellent enterprise strategy, even in the necessary time can also make a trap to confuse opponents.

### III. ENTERPRISE VIRTUAL OPERATION EVALUATION SYSTEM BASED ON MANAGEMENT ACCOUNTING

If decisions and predictions are made only by relying on the information in the report of enterprise virtual operation, the most profound meaning of financial information cannot be read objectively and the relevance and reliability of a lot of information is not shown intuitively. Among all kinds of information, in order to improve the sensitivity and comprehensibility of effective information for enterprise virtual operation operators, it is particularly important to find a more intuitive way of expression to show the relationship between data.

### IV. THE USE OF MANAGEMENT ACCOUNTING IDEAS IN ENTERPRISE VIRTUAL OPERATING STATEMENTS

According to the international federation of accountants (IFAC) point of view, and a management accounting refers

to the organization, to management for planning, evaluation and control of information (financial and operational) to carry on the recognition, measurement, accumulation, analysis, processing, interpretation and transfer process, to ensure that the use of its resources and management responsibility. In the definition of management accounting, "planning", "evaluation" and "control" are the core behaviors of management accounting, and the object of which is "financial and operational information".

The above text description is exactly in line with the virtual operation of the enterprise, so management accounting methods and methods can be introduced into the virtual operation statements of enterprises. Therefore, the operating data of the commercial sand table can be used to simulate the operating system for analysis. The following shows the raw data table for the third year and a simple analysis of managerial accounting ratios:

TABLE I. THIRD YEAR REPORT COMPREHENSIVE EXPENSE STATEMENT

Username	U07	U09	U11	U13	U14	AVE
<i>administrative fee</i>	40	40	40	40	40	40
<i>advertising</i>	75	166	105	125	142	122.6
<i>Maintenance fee</i>	40	40	40	40	60	44
<i>loss</i>	0	0	0	0	0	0
<i>Conversion fee</i>	0	0	0	0	0	0
<i>rent</i>	0	0	0	0	30	6
<i>Market development fee</i>	10	20	20	20	20	18
<i>Product r&amp;d</i>	40	80	40	0	20	36
<i>ISO certification fee</i>	20	30	30	30	30	28
<i>Information costs</i>	0	0	0	0	0	0
<i>summation</i>	225	376	275	255	342	294.6
<i>Management fee rate</i>	17.8	10.6	14.5	15.7	11.7	13.6
<i>Advertising rates</i>	33.3	44.1	38.2	49	41.5	41.6
<i>Maintenance fee</i>	17.8	10.6	14.5	15.7	17.5	14.9
<i>Loss rate</i>	0	0	0	0	0	0
<i>Conversion rate</i>	0	0	0	0	0	0
<i>rental rate</i>	0	0	0	0	8.8	2
<i>Market development rate</i>	4.4	5.3	7.3	7.8	5.8	6.1
<i>Product development rate</i>	17.8	21.3	14.5	0	5.8	12.2
<i>ISO rates</i>	8.9	8	10.9	11.8	8.8	9.5
<i>Information rate</i>	0	0	0	0	0	0

TABLE II. INCOME STATEMENT

Username	U07	U09	U11	U13	U14	AVE
<i>Sales revenue</i>	960	1160	920	1510	1330	1176
<i>Direct costs</i>	420	430	370	650	520	478
<i>Gross profit</i>	540	730	550	860	810	698
<i>Comprehensive cost</i>	225	376	275	255	342	294.6
<i>Earnings before depreciation</i>	315	354	275	605	468	403.4
<i>depreciation</i>	140	120	140	140	140	136
<i>Profit before interest payment</i>	175	234	135	465	328	267.4
<i>Finance charges</i>	140	71	80	214	201	141.2
<i>Pre-tax profits</i>	35	163	55	251	127	126.2
<i>Income tax</i>	0	20	10	3	10	8.6
<i>Annual net profit</i>	35	143	45	248	117	117.6
<i>Sales gross margin</i>	56.3	62.9	59.8	57	60.9	59.4
<i>Combined rate</i>	23.4	32.4	29.9	16.9	25.7	25.1
<i>Financial expense ratio</i>	38.4	15.9	22.5	45.6	37	32.4
<i>Net sales rate</i>	3.6	12.3	4.9	16.4	8.8	10
<i>Cost rate</i>	86.9	104	95.9	72.2	104.4	91.2
<i>Profit rate of expenses</i>	9.6	32	12.7	52.9	21.5	27

**TABLE III. BALANCE SHEET**

User name	U07	U09	U11	U13	U14	AVE
<i>Cash</i>	334	438	215	27	125	227.8
<i>The accounts receivable</i>	560	570	430	510	494	512.8
<i>Work In Process</i>	0	100	100	140	150	98
<i>Finished goods</i>	30	0	60	0	30	24
<i>Material</i>	0	0	0	0	60	12
<i>Total current assets</i>	924	1108	805	677	859	874.6
<i>workshop</i>	400	400	400	400	300	380
<i>Machinery equipment</i>	560	480	560	560	860	604
<i>Construction in progress</i>	0	300	0	250	300	170
<i>Total tangible assets</i>	960	1180	960	1210	1460	1154
<i>Total assets</i>	1884	2288	1765	1887	2319	2028.6
<i>Long-term loans</i>	1000	422	508	574	504	601.6
<i>Short-term loans</i>	369	1136	566	653	1126	770
<i>Special loan</i>	0	0	0	0	0	0
<i>Income tax</i>	0	20	10	3	10	8.6
<i>Total liabilities</i>	1369	1578	1084	1230	1640	1380.2
<i>Equity capital</i>	650	650	650	650	650	650
<i>profit retained</i>	-170	-83	-14	-241	-88	-119.2
<i>The annual net profit</i>	35	143	45	248	117	117.6
<i>Total equity</i>	515	710	681	657	679	648.4
<i>Total Liabilities and Capital</i>	1884	2288	1765	1887	2319	2028.6
<i>Shareholders' capital injection</i>	0	0	0	0	0	0
<i>Maximum loan amount</i>	176	552	959	741	397	565
<i>Asset-liability ratio</i>	72.7	69	61.4	65.2	70.7	68
<i>The rights and interests multiplier</i>	365.8	322.3	259.2	287.2	341.5	312.9
<i>Equity ratio</i>	265.8	222.3	159.2	187.2	241.5	212.9
<i>Current ratio</i>	250.4	97.5	142.2	103.7	76.3	113.6
<i>Cash ratio</i>	90.5	38.6	38	4.1	11.1	29.6

According to the original comprehensive cost table "Table I", "Table II" and "Table III", it can be concluded that the organization chooses the strategy of high advertising cost U09 and U14, the group chooses the strategy of low comprehensive cost U07 and U11, and the organization chooses the strategy of high financial cost U13 and U14.

According to the analysis of profit table, the high gross profit rate of sales can be obtained compared with that of U09, U11 and U14, representing that these three groups mainly produce products having higher gross profit rate. By effectively reducing costs and expenses, U13 has relatively high net sales interest rate, which is more than 60% of the average. It proves that the overall profitability of U13 in the third year is very good. If it can insist on such financial data, U13 is also highly competitive.

Through the analysis of the balance sheet, it can be seen that both U07 and U14 have a large equity multiplier, which means that the efficiency of 10,000 owners' equity is relatively high. The asset-liability ratio of about 70% in the early stage is not only in line with the means of taking loans as the main source of funds in the early stage, but also a relatively reasonable proportion of the whole manufacturing enterprises. In comparison, the asset-liability ratio of U09, U11 and U13 is relatively low, and the owner's equity is slightly improved. Therefore, the three groups have strong debt financing ability and development potential in the fourth year. In terms of flow rate, the flow rate of group U07 is too high, which is twice higher than the average value, proving that it is not conducive to the rapid development of enterprises to invest more capital into the current assets with weak value creation ability. By contrast, U13 and U14 group

cash ratio is very low, prove that the two groups of asset allocation mainly has strong profitability of the business of fixed assets is given priority to, for profit ability are relatively weak current assets take the fund will be a little small, another is proved that each group of funds grasp correctly, the details of the calculation precision.

#### V. COMPREHENSIVE EVALUATION OF MANAGEMENT ACCOUNTING THOUGHTS IN THE PREDICTION OF ENTERPRISE VIRTUAL OPERATION ENTERPRISES

In the last year, U09 won the leading company in the industry with the advantage of nearly 300 in the second place and 500 in the third place. In the last year, 9 production lines were built together, showing all the preparatory achievements it had made before: 4 big plants, 24 automatic lines, 1700+ cash, about 3500 receivables and various qualifications have not been able to challenge the dominance of U09. In comparison, U11 and U14 are not only inferior to U09 in operation, but even U14 chose to start with small factory that is conservative in the first year when formulating the strategy, and finally chose to use small factory all the way, making it impossible to expand the production line even if U14 has idle funds. In terms of production capacity, U14 is not worse than U09, and even once had a great advantage. However, U14 did not make a fight without being too far behind. In the end, the inventory of 260 failed to create its due value. On the contrary, U09 increased its expense margin to 121.6% even though the comprehensive cost was the highest in the long preparation.

The following is an analysis of the ability of each group to match at a specific rate for the last cycle.

**TABLE IV. COMPREHENSIVE ANALYSIS REPORT**

<b>Username</b>	<b>U07</b>	<b>U09</b>	<b>U11</b>	<b>U13</b>	<b>U14</b>	<b>AVE</b>
<b>Debt paying ability</b>						
<i>Current ratio</i>	117.1	111.9	249.7	406.1	257.6	228.5
<i>Asset-liability ratio</i>	54.9	67.3	62	67.7	68.1	64
<i>Equity ratio</i>	121.7	205.7	163.3	209.5	213.4	182.7
<i>Equity Multiplier</i>	221.7	305.7	263.3	309.5	313.4	282.7
<i>debt-to-long capital ratio</i>	11.2	28.4	47.4	62.7	52.4	40.4
<i>interest cover ratio</i>	540.8	688.8	482.8	354.3	567.2	526.8
<b>Operation ability</b>						
<i>turnover of account receivable</i>	238.7	183.9	183	198	173.4	195.4
<i>inventory turnover</i>	2252.3	1898.1	652.1	683.3	632.4	1223.6
<i>velocity of liquid assets</i>	136.2	112.2	112.1	129.1	91.7	116.3
<i>Turnover of non-current assets</i>	185.7	151.1	148.4	153.6	181.8	164.1
<i>Total Asset Turnover</i>	78.6	64.4	63.8	70.2	60.9	67.6
<b>Profitability</b>						
<i>Operating margin</i>	28.8	29.1	25.7	25.3	27.3	27.2
<i>Cost rate</i>	221.7	223.8	199.8	213.3	206.1	212.9
<i>Return on Total Asset</i>	28.1	18.1	18.6	20.4	16.8	20.4
<i>Return on Net Assets</i>	38	35	29	34	32	33.6
<b>Development capacity</b>						
<i>Increase rate of main business revenue</i>	82.4	33.4	18.7	30.6	38.6	40.7
<i>Growth rate of operating profit</i>	403.6	72.3	25.3	42.2	67.5	122.2
<i>Appreciation rate of asset value preservation</i>	161.5	154.7	141	151.4	148.1	151.3
<i>Total Assets Growth Rate</i>	-2.6	55	26.3	54.3	50.9	36.8

<sup>a</sup> The gray fill indicates the bankrupt enterprise, the black fill indicates the highest value, and the black type indicates the lowest value.

According to "Table IV", it can be seen that from the Angle of insolvency, most U14 ratio index is high, especially on assets structure is very high, the ratio of prove U14 owners' equity capital efficiency and financial risks are relatively high, and on the indexes of the multiple of interest safeguard is property debt less U09 group performance is more outstanding, prove U09 with strong strength on interest payments, flush with cash.

In terms of operation capacity, compared with group U14 and group U09, various asset turnover rates are generally higher. It can be known that under the condition of keeping the total assets unchanged, the higher the asset turnover rate is, the faster it can promote the withdrawal of funds, thus increasing the total amount of funds in a disguised way. U11 and U14 are relatively weak in this regard, while U09 has a very strong operating capacity.

In terms of profitability, the profitability of U09 is very excellent, and the highest cost rate can be obtained under the premise of high costs; the highest operating margins with the highest cost and expense ratios. However, when the asset-liability ratio is not the highest, the highest return rate of net assets can be maintained, which proves that the capital efficiency of the group's owner's equity is higher than that of U11 and U14.

In terms of development capability, whether an enterprise has vitality and prospects, while having a steady flow of capital, the growth of various assets is also an important reference indicator. In terms of development ability, U09 and U14 differ in different aspects, but the difference is that U14 is more biased toward the development of vectors, while U09 is more qualitative. , the growth rate of operating profit, the value-added rate of capital preservation and the growth

of total assets, which further indicates that U09 still maintains a very strong development momentum at present.

Throughout the game, the data presented is relatively complex, but reading the data in different ways brings different perspectives. For example, the commonly used asset-liability ratio was about 70% in the early stage. That is because earlier owners' equity needed more leverage to sustain rapid growth. In the later period, this proportion decreased to about 65%, because in the later period of operation, the business ability of the enterprise was improved, and the development of the enterprise was maintained by expanding its own business. If you want to know whether the enterprise's indicators are in a relatively reasonable position, you can refer to the values in the column of AVE for judgment and adjustment.

## VI. CONCLUSION

The management accounting evaluation system is an information management activity based on financial data, integrating business and finance. The evaluation system itself is very consistent with the informatization required by enterprise virtual operation. The use of management tools in the evaluation system makes the analysis results more scientific and reliable. The management accounting evaluation system can help the friends who just come into contact with the enterprise virtual operation to quickly understand the mystery, and help a pair of friends who have a certain understanding of the enterprise virtual operation to formulate more scientific and more reasonable strategies and tactics. However, this is not a panacea. In order to truly play the virtual operation of the enterprise, it's necessary to integrate our thoughts into it and find a set of virtual

operation practices that truly belong to us. There is no winning routine, only winning vision.

#### REFERENCES

- [1] Wang Ying, Xu Feng, Zhou Zhe. Positioning, objectives and teaching design analysis of ERP sand table practice course [J]. *Experimental technology and management*, 2013, 30(4): 120-123.
- [2] Gong Lixin. Research on financial management based on ERP environment [J]. *China chief accountant*, 2010
- [3] Huang Sujuan. On the role of ERP system in strengthening enterprise financial management [J]. *Enterprise research*, 2011