

Available online at www.sciencedirect.com**SciVerse ScienceDirect**

Procedia - Social and Behavioral Sciences 28 (2011) 205 – 210

Procedia
Social and Behavioral Sciences

WCETR 2011

A Proposed model for strategic planning in educational organizations

Abazar Zohrabi^{a*}, Nikzad Manteghi^b^a*M.Sc. in Industrial Management, Department of Industrial Management, Shiraz Branch Islamic Azad University, Shiraz, Iran*^b*Associate professor, Department of Industrial Management, Shiraz Branch Islamic Azad University, Shiraz, Iran*

Abstract

This paper is proposing a comprehensive framework in order to formulate strategy in Educational organizations. This approach is based on Malcolm Baldrige National Quality Award (MBNQA) Education Criteria for selecting competitive strategies. In this method, firstly, by using SWOT matrix, we have formulated initial strategies of the organization. After that, we have allocated these strategies to four BSC perspectives. Then making use of these strategies in the House Of Quality (HOQ) as "Whats/ alternatives", we subsequently considered MBNQA Education Criteria with the role of "Hows/ criteria" in the HOQ as a criteria for selection of strategies. Finally we performed screening and selection of initial strategies by using fuzzy screening technique. A case study is utilized to show the efficiency of the proposed model.

© 2011 Published by Elsevier Ltd. Open access under [CC BY-NC-ND license](http://creativecommons.org/licenses/by-nc-nd/3.0/).

Keywords: SWOT matrix; Balanced scorecard (BSC); Quality function deployment (QFD) methodology; Malcolm Baldrige National Quality Award (MBNQA) Education Criteria ; fuzzy screening technique

1. Introduction

As no organization has unlimited resources, and due to competitive dominant environment, formulating the competitive strategies target which lead organization to the macro goals, is very important. That's why at organization spend their resources on extraneous purposes, they will easily substitute their rivals on behalf of themselves. So they are supposed to formulate the appropriate strategies to attend the competitive area. We have rendered a proposed frameworks in which Malcolm Baldrige National Quality Award (MBNQA) Education Criteria, is chosen as the criteria for selecting and screening the strategies at Educational organizations. In fact this framework is a combination of SWOT analysis, Balanced scorecard (BSC); Quality function deployment (QFD) methodology; Malcolm Baldrige National Quality Award (MBNQA) Education Criteria; fuzzy screening technique. The last models of Lee & Loo (2003) contains the traditional QFD. But in this paper to reduce uncertainty and ambiguity of data, we have use fuzzy QFD that increase the capability and efficiency of the model

2. Literature review

2.1. SWOT Analysis

SWOT is a management tool to formulate strategic action plans. SWOT is an acronym for strengths,

* Abazar Zohrabi Tel.: +98-917-4546970; fax: +98-711-6281744.

E-mail address: abazar.zohrabi@gmail.com

weaknesses, opportunities and threats. SWOT matrix analyzes the internal strengths and weaknesses as well as external opportunities and threats to derive promising future strategies. (Rauch, 2007). It should be noted also that SWOT is a strategic tool accommodating internal strengths and weaknesses with external opportunities and threats. SWOT analysis is a systematic analysis for identifying these factors that formulates strategies by creating the best accommodation between internal and external factors. So through analogy of these factors, it can present four types of strategies such as SO, ST, WO and WT. Therefore, SWOT matrix is a tool which is used in this research in order to formulate initial strategy of instructional organization.

2.2. Balanced Scorecard

BSC is a strategic approach and performance management system which organizations can use for vision and strategy implementation. The BSC model comprises four new management processes that, separately and in combination, help link long-term strategic objectives with short-term actions (Kaplan & Norton, 1996). The BSC includes a set of measures to monitor organizational performance across four linked perspectives - financial, learning and growth, customer and internal process- associated with value creation. BSC advantage is the point that provides the leading and lagging indicators at the disposal of managers. The term balance is used in BSC because balanced scorecard creates the balance between financial and non-financial indicators, measurable and immeasurable scales, internal and external aspects and similarly the functional stimulus and results. The relationship between strategic planning and balanced scorecard is very important; hence we can consider them as complementary tools. Actually BSC translates strategic guidelines described in strategic planning in such a way that everyone in the organization can perceive them. (Kaplan & Norton, 2004). The BSC has grown out itself from being just a strategic initiative to its present form of a performance management system. The BSC, as it is today, is a performance management system that can be used by organizations of any size to align the vision and mission with all the functional requirements and day-to-day work.

2.3. Quality Function Deployment (QFD)

The Quality Function Deployment was originated in the late 1960s to early 1970s, in Japan, by Professor Yoji Akao. QFD is a systematic method and analysis for acquiring the demands of customers. "QFD provides a means of translating customer requirements into appropriate technical requirements for each stage of product development and production (i.e., marketing strategies, planning, product design and engineering, prototype evaluation, production process development, production, sales)" (Sullivan, 1986). A central element in QFD is the so-called "House of Quality" (Poel, 2007). HOQ made up of two main parts, the "What's" and the "How's". While using QFD the most important task is to define and understand the "whats" of the needs of the customers and to define the "Hows" to meet the customer's need (Tan et al, 1998). Recent studies have indicated that QFD can be a useful mechanism for identifying business priorities and can be effective as a strategic planning tool. (Maritan & Panizzolo, 2009). Strategic QFD with definite method translates the vision into action in a series of logical steps. Therefore it creates innovative strategies for acquiring organisation's vision (Killen et al, 2005).

2.4. MBNQA Education Criteria

MBNQA is an initiative by the US Government to promote the concept of quality and quality management to the enterprises in order to maintain their national competitiveness. Traditionally, only the manufacturing and commercial organizations would apply for MBNQA. However, starting from 1999, education institutions are eligible to apply for the MBNQA with the newly introduced Education Criteria 1999 for performance excellence (MBNQA-EC) and the major criteria is summarized as follows: 1. Leadership, 2. Strategic planning, 3. Student and stakeholder focus, 4. Information and analysis, 5. Staff focus, 6. Educational and support process management, 7. Course performance results

2.5. Fuzzy Screening

Fuzzy Screening involves the participation of several experts in decision-making process. Furthermore, each offered decision by experts is based on several criteria. (Fuller, 2000). Fuzzy screening includes three parts: First part is a collection of decision-making alternatives which we will choose among them a small subset for more investigation: $A = \{A_1, A_2, \dots, A_m\}$. Second part consists of criteria collection for evaluating alternatives based on them: $C = \{C_1, C_2, \dots, C_m\}$. Third part as forming a group of experts which their options is solicited in screening the alternatives: $E = \{E_1, E_2, E_3, \dots, E_r\}$. Regarding the above opinions, the fuzzy screening system is a two stage process; in the first stage we want every individual to present its evaluation about each alternative and also

weighting different criteria based on linguistic scales. On the other hand, each expert should state how much each alternative can satisfy criteria. In the second stage, introduced methodology is applied to aggregate the individual experts' evaluations to obtain an overall linguistic value for each object. This overall evaluation can then be used by the decision makers as an aid in the selection process (Yager, 1993).

3. Proposed methodology

Step1. Formulating initial strategy by SWOT matrix: by using SWOT matrix, the main internal and external key factors are compared and Initial strategy is formulated for the organization.
 Step2. Linking the SWOT analysis with the balanced scorecard: By linking the SWOT analysis with the balanced scorecard, an organization can balance its strengths against its competition's weaknesses, and optimize its Opportunities within the market (Lee & Ko, 2000)
 Step3. Applying strategies derived from previous steps in HOQ as (Whats). In fact, HOQ in a simple and concrete form with relating Hows and whats to each other can help to translate the different elements of strategic planning.
 Step 4.Applying MBNQA Education Criteria in HOQ as (Hows): the Education Criteria of the MBNQA indicate as the "Hows" in the strategic planning of the QFD.
 Step5. Screening Strategies Using Fuzzy Screening Technique : various inputs, in the form of judgments and evaluations are needed in the QFD charts; this gives rise to uncertainties when trying to quantify the information. In order to reduce the uncertainty in the collected data, fuzzy logic can be used (Bouchereau & Rowlands, 2000). After completing HOQ, the fuzzy screening technique is used to screen and classify prior strategies. Each strategy of SWOT analysis is segregated in four BSC perspectives, considered as (alternatives / Whats) and MBNQA Education Criteria as (criteria / Hows).

4. Application of methodology to screen Strategies of a university

To implement the above four steps we selected one Iranian university as the case study.. Results of steps 1, 2, 3, and 4 have been shown in figure (1). In step 5, the first expert's team was asked to state a grade of importance of criteria in the scale S. the result of shown in Table (1). The criteria for screening strategies in this research include C₁ : Leadership, C₂: Strategic planning , C₃ : Student and stakeholder focus, C₄ : Information and analysis, C₅ : Staff focus , C₆ : Educational and support process management , C₇ : Course performance results

																Hows		Whats																	
																interactions with other universities in order to perform scientific research activities. creating new trends in MA, proportional to graduated students demand in the undergraduates Creating interdisciplinary courses Adjusted forces in various sectors Preparation hardware and software possibilities to provide virtual trainings especially in MA using audio and visual facilities in education Organizing workshops of writing essays Organizing scientific conferences - regional and national research establishing closer relationships with the industrial and economic sectors Managing relationships with suppliers Creating a wireless system in the dormitories Increasing advertisements and marketing development to attract more Students Developing CRM Using of credit facilities by banks forming a committee to attract new credit sources Holding efficient service training periods, especially to faculty members																			
Learning and growth perspective		Financial perspective		Customer perspective				Internal process perspective																											
study relationship between Whats and Hows through fuzzy screening technique (fuzzy relationship matrix)																Leadership		Strategic planning		Student and stakeholder focus		Information and analysis		Staff focus		Educational and support process management		Course performance results							
																S ₁₆		S ₁₅		S ₁₃		S ₁₁		S ₁₀		S ₉		S ₈		S ₃		S ₂		S ₁	
																screened strategies																			
																S ₁₆		S ₁₅		S ₁₃		S ₁₁		S ₁₀		S ₉		S ₈		S ₃		S ₂		S ₁	
																screened strategies																			

Figure 1. Linking SWOT, BSC, QFD and fuzzy screening

Table 1. grade of importance of criteria

criteria	C ₁	C ₂	C ₃	C ₄	C ₅	C ₆	C ₇	criteria	C ₁	C ₂	C ₃	C ₄	C ₅	C ₆	C ₇
expert								expert							
1	L	M	OU	VH	M	H	VH	13	M	M	VH	VH	H	H	H
2	M	M	VH	H	H	M	OU	14	L	H	VH	H	M	M	VH
3	M	H	H	H	M	H	H	15	M	M	OU	VH	H	VH	OU
4	L	H	H	VH	M	VH	H	16	M	H	VH	VH	M	H	H
5	M	M	VH	VH	M	H	VH	17	M	M	OU	H	M	H	H
6	M	H	H	OU	H	M	H	18	M	M	VH	VH	H	H	VH
7	H	H	VH	VH	M	H	VH	19	L	M	OU	H	M	H	H
8	L	M	H	H	M	H	H	20	L	M	OU	VH	M	H	VH
9	H	H	OU	H	H	H	VH	21	L	M	OU	VH	M	M	H
10	L	H	H	H	H	M	VH	22	M	M	VH	VH	M	H	VH
11	H	H	OU	H	H	H	OU	23	L	M	VH	H	M	H	H
12	M	H	VH	H	M	VH	VH	24	M	H	VH	VH	M	H	H

Then each of experts was asked to specify the level of possibility of satisfaction of desired criteria in connection with each alternative (initial strategy). The results have been shown in Table (2). Next stage is identifying unit evaluation by each expert of any alternatives (initial strategy). For this ,we initially calculate negative of importance for each of scale S elements by using the formula(1) $Neg(S_i)=S_{7-i+1}$ (1) $Neg(VH)= VL$, $Neg(H)= L$, $Neg(M)=M$ $Neg(L)=H$, $Neg(VL)= VH$, $Neg(N)= OU$

Then unit score for alternatives by each expert is calculated using the formula (2) . That it has been done for the strategy of “Creating interdisciplinary courses ” .the result have been shown in table (3)

$$U_{ik}=\min\{Neg(I_{kj})\nu\pi_{ikj}\} \quad i=1,2,3\dots m \quad k=1,\dots,r \quad (2)$$

Table 2. level of possibility of satisfaction of desired criteria

strategy	criteria expert	C ₁	C ₂	C ₃	C ₄	C ₅	C ₆	C ₇	criteria expert	C ₁	C ₂	C ₃	C ₄	C ₅	C ₆	C ₇
Creating interdisciplinary courses	1	H	VH	M	OU	M	H	OU	13	H	OU	H	H	H	H	H
	2	H	OU	M	VH	M	H	VH	14	H	VH	M	OU	M	H	VH
	3	VH	H	H	OU	M	M	H	15	H	H	H	H	H	H	VH
	4	H	VH	M	H	M	H	OU	16	H	VH	M	H	H	M	H
	5	H	VH	M	OU	H	H	VH	17	H	OU	VH	VH	H	H	H
	6	H	VH	H	VH	H	H	H	18	M	VH	H	H	M	H	H
	7	H	VH	VH	H	H	M	VH	19	M	VH	H	H	M	M	VH
	8	M	M	H	VH	M	H	OU	20	H	VH	H	VH	H	H	H
	9	H	H	H	H	M	M	H	21	M	H	M	H	M	M	H
	10	M	H	M	H	M	M	H	22	H	OU	H	VH	M	M	VH
	11	H	H	M	VH	M	M	H	23	M	H	H	H	H	H	VH
	12	H	VH	M	M	M	H	OU	24	H	VH	M	VH	M	M	H

Now, it is turn to combine conducted evaluation by experts to reach a general evaluation of any alternative .To do this, first we sorted unit scale of experts as descending. The result have been shown in Table (4)

After that we consider aggregation function of making decision body as an average function $Q(K)$, then with $r=24$, $q=7$ and by using the formula(3). We provide Table (5) $(Q_A)_k=S_{b(k)} \quad b_k=\text{int}[1+k \frac{q-1}{r}]=\text{int}[1+\frac{k}{4}]$ (3)

Finally, the overall evaluation of the desired alternative ‘Creating interdisciplinary courses ‘will be by using the formula 4: $U_i=\max \{Q(j) \Lambda B_{ij}\}$ (4)

Table3. Unit score for strategy. $\min \{ \text{Neg} (I_{ki}) \vee \pi_{ki} \}$

strategy	criteria expert	C ₁	C ₂	C ₃	C ₄	C ₅	C ₆	C ₇	min	criteria expert	C ₁	C ₂	C ₃	C ₄	C ₅	C ₆	C ₇	min
Creating interdisciplinary courses	1	H	VH	M	OU	M	H	OU	M	13	H	OU	H	H	H	H	H	H
	2	H	OU	M	VH	M	H	VH	M	14	H	VH	M	OU	M	H	VH	M
	3	VH	H	H	OU	M	M	H	M	15	H	H	H	H	H	H	VH	H
	4	H	VH	M	H	M	M	H	M	16	H	VH	M	H	H	H	VH	M
	5	H	VH	M	OU	H	H	VH	H	17	H	OU	VH	VH	H	H	H	H
	6	H	VH	H	VH	H	H	H	H	18	M	VH	H	H	M	H	H	M
	7	H	VH	VH	H	H	M	VH	M	19	H	OU	H	VH	M	M	VH	M
	8	H	M	H	VH	M	H	OU	M	20	H	VH	H	VH	H	H	H	H
	9	H	H	H	H	M	M	H	M	21	H	H	M	H	M	M	H	M
	10	H	H	M	H	M	M	H	M	22	H	OU	H	VH	M	M	VH	M
	11	H	H	M	VH	M	M	H	M	23	H	H	H	H	H	H	VH	H
	12	H	VH	M	M	M	H	OU	M	24	H	VH	M	VH	M	M	H	M

Table 4. Sorted unit scal of experts as descending

B ₁₁ =H	B ₁₂ =H	B ₁₃ =H	B ₁₄ =H	B ₁₅ =H	B ₁₆ =H
B ₁₇ =H	B ₁₈ =M	B ₁₉ =M	B ₁₁₀ =M	B ₁₁₁ =M	B ₁₁₂ =M
B ₁₁₃ =M	B ₁₁₄ =M	B ₁₁₅ =M	B ₁₁₆ =M	B ₁₁₇ =M	B ₁₁₈ =M
B ₁₁₉ =M	B ₁₂₀ =M	B ₁₂₁ =M	B ₁₂₂ =M	B ₁₂₃ =M	B ₁₂₄ =M

Table 5. Aggregation function results

k=1	Q _A (1)=N	S ₁	k=2	Q _A (2)=N	S ₁	k=3	Q _A (3)=N	S ₁	k=4	Q _A (4)=VL	S ₂
k=5	Q _A (5)=VL	S ₂	k=6	Q _A (6)=VL	S ₂	k=7	Q _A (7)=VL	S ₂	k=8	Q _A (8)=L	S ₃
k=9	Q _A (9)=L	S ₃	k=10	Q _A (10)=L	S ₃	k=11	Q _A (11)=L	S ₃	k=12	Q _A (12)=M	S ₄
k=13	Q _A (13)=M	S ₄	k=14	Q _A (14)=M	S ₄	k=15	Q _A (15)=M	S ₄	k=16	Q _A (16)=H	S ₅
k=17	Q _A (17)=H	S ₅	k=18	Q _A (18)=H	S ₅	k=19	Q _A (19)=H	S ₅	k=20	Q _A (20)=VH	S ₆
k=21	Q _A (21)=VH	S ₆	k=22	Q _A (22)=VH	S ₆	k=23	Q _A (23)=VH	S ₆	k=24	Q _A (24)=OU	S ₇

$$U_i = \max \{ N \wedge H, N \wedge H, N \wedge H, VL \wedge H, VL \wedge H, VL \wedge H, VL \wedge H, L \wedge M, L \wedge M, L \wedge M, L \wedge M, M \wedge M, M \wedge M, M \wedge M, M \wedge M, H \wedge M, H \wedge M, H \wedge M, H \wedge M, VH \wedge M, VH \wedge M, VH \wedge M, VH \wedge M, OU \wedge M \} = \text{Max} \{ N, N, N, VL, VL, VL, VL, L, L, L, L, M, M, M, M, M, M, M, M, M, M, M, M, M, M, M \} = M$$

Therefore evaluation of “Creating interdisciplinary courses ” with average aggregation function is medium and because the standard in selecting strategy in this university are those strategies which their importance is equal or greater than Medium, hence this strategy is selected .According to this method, the results of screening other strategies have been shown in Figure 1.

Conclusion

This paper offered a framework in order to formulate strategy in educational organizations. Applying SWOT analysis, we formulated initial strategies, and then allocated these strategies in four perspectives of BSC; this is a step toward the implementation of the balanced scorecard. In this paper regarding the role of QFD as a suitable tool for linking between different elements of strategic planning, the house of quality was used to study relationships between Whats and Hows . Eventually the Fuzzy Screening techniques were used to investigate the relationship between "Hows / Criteria" and "Whats / Alternative".

References

- Bouchereau, V., & Rowlands, H. (2000). Methods and techniques to help quality function deployment (QFD). Benchmarking: *An International Journal*, Vol. 7 No. 1, 8-9.
- Eskay, M. (2011). Harmonizing educational differences from an international perspective. *Cypriot Journal Of Educational Sciences*, 6(1), 30-36.
- Fuller, R. (2000). Introduction to Neuro – Fuzzy Systems, Studies in Fuzziness and Soft Computing, Physica-Verlag, a Springer- Verlag Company
- Kaplan, R. S., & Norton, D. P. (1996). Using the balance scorecard as a strategic management system. *Harvard Business Review*, 74(1), 75–85.
- Kaplan, R.S., & Norton, D.P. (2004). *Strategy Maps: Converting Intangible Assets into Tangible Outcomes*. Harvard Business School Publishing Corporation, New York, NY.
- Killen, C.P., & Walker, M., Hunt, R.A. (2005). Strategic planning using QFD. *International Journal of Quality & Reliability Management*, Vol. 22 No. 1, 17-29
- Lee, S.F., & KO, K.O. (2000). Building balanced scorecard with SWOT analysis, and implementing "Sun Tzu's The Art of Business Management Strategies" on QFD methodology. *Managerial Auditing Journal*, 15/1/2, 68-76
- Lee, S.F., LO, K.K. (2003). e-Enterprise and management course development using strategy formulation framework for vocational education. *Journal of Materials Processing Technology*, 139, 604–612
- Maritan, D., & Panizzolo, R. (2009). Identifying business priorities through quality function deployment. *Marketing Intelligence & Planning*, Vol. 27 No. 5, 714-28
- Poel, I. (2007). Methodological problems in QFD and directions for future development. *Res Eng Design*, 18, 21-36
- Rauch, P. (2007). SWOT analyses and SWOT strategy formulation for forest owner cooperations in Austria. *Eur J Forest Res*, 126, 413-420
- Sullivan, L.P. (1986). Quality function deployment", *Quality Progress*, Vol. 19 No. 6, pp. 39-50.
- Tan, K.C., Xie, M. & Chia, E. (1998). Quality function deployment and its use in designing information technology systems", *International Journal of Quality & Reliability Management*, Vol. 15 No. 6.
- Yager, R.R. (1993). Fuzzy Screening Systems, in: R. Lowen and M. Roubens eds., *Fuzzy Logic: State of the Art*, Kluwer, Dordrecht, 251-261