
Holistic approach for diagnosing, prioritising, implementing and monitoring effective strategies through synergetic fusion of SWOT, Balanced Scorecard and QFD

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Abstract: The integrative fusion of three powerful strategic tools yields obvious synergetic benefits for strategy planners. This holistic approach provides a pragmatic framework for developing a list of Key Success Factors (KSFs) and converting them into the respective internal strengths and weaknesses of an organisation. A systematic way is adopted to explore and evaluate the significance and likelihood of occurrence of various external factors to generate the list of external opportunities and threats. Matching the internal factors with the external factors, the SWOT analysis yields a list of action items as the basis for strategies. Slotting these action items (strategic performance measures) in the BSC framework portrays subjective yet democratic 'cause and effect' relationships among them through QFD. A Double House Of Quality (Double HOQ) is introduced to depict the relationships among the internal KSFs and the derived strategies. This holistic strategic formulation approach is called BSQ (short-form of Balanced Scorecard-SWOT-QFD).

Keywords: strategic management; balanced scorecard; BSC; SWOT; QFD; Double HOQ; BSQ model.

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1 Introduction

Strategic formulation is an important task for the top executives of any organisation. Put simply, strategy development is about analysing existing and desired status and then deciding the most effective means (hows) to achieve the objectives (whats). In practice, strategy formulation is a very complicated process which requires adopting a systematic approach to diagnose the external factors and to match these external factors with the internal capabilities of the organisation (Wehrich, 1982). The failure and success of an organisation are closely linked to how the strategies are developed and implemented. Therefore strategic management has become an indispensable subject in any business administration curriculum. There are numerous approaches to strategic development, e.g., Profit Impact of Marketing Strategy, BCG Matrix, McKinsey's GE Matrix, Porter five forces, McKinsey's 7S, SWOT, Quality Function Deployment (QFD), BSC, ADL life-cycle Matrix (Feurer and Chaharbaghi, 1997; Kaplan and Norton, 1996, 2001, 2004; Wehrich, 1982; Ip and Koo, 2004; Crowe and Cheng, 1996).

There are always some limitations when adopting the use of any single strategic tool. Therefore the integration of BSC, SWOT analysis, and QFD provides a more practical, comprehensive, and systematic approach to diagnose the organisation and to build a holistic strategic framework (Koo, 1998; Koo et al., 2005; Ip and Koo, 2004).

Kaplan and Norton (1996) point out that the financial perspective measures in the BSC are the ultimate and most important performance indicators for any commercial enterprise. They emphasise that the non-financial indicators are the 'causes (drivers)' and the financial indicators are the 'effects (outcomes)'. It is very important to establish the cause-and-effect relationship among them, which can clearly explain the rationale of the strategic thinking of the organisation. However Kaplan and Norton (1996) suggest the use of correlation to establish the cause-and-effect relationships among the various BSC measures. The correlation relation is only a necessary condition and not a sufficient condition to establish a cause-and-effect relationship. In this respect, Koo (1997) proposes the use of a statistical instrument like LISREL (Linear Structural Equation Modelling) to explore the cause-and-effect relationship. In fact, Chan et al. (2003) report the use of AMOS (a SPSS version of Structural Equation Modelling) to calculate the path coefficients of the various attributes in the Total Management System of the MTR Corporation in Hong Kong. Unfortunately the LISREL is rather complicated and it requires historical data for the computation and these data would normally be non-existent at the time of developing the strategies. The adoption of QFD in the BSQ approach fills this research gap nicely. QFD enables the management team in an organisation to subjectively and collectively quantify the 'cause-and-effect' relationship in a democratic manner. The individuals of the management team score their perceived strengths of cause-and-effect relations on a scale of ten points. If an obvious discrepancy exists among the subjective scores, they are encouraged to clarify the reasons for their scores, to eliminate possible misunderstanding. These constructive dialogues can help remove communication problems, reach consensus views, and enhance subsequent cooperation in implementing the strategies.

2 Balanced Scorecard (BSC): SWOT – Quality Function Deployment (QFD)

2.1 Balanced Scorecard (BSC)

BSC has been widely reckoned as a contemporary approach to measure and manage the performance of a corporation (Hepworth, 1998) and it can link up the strategies and vision of an organisation (Gadd, 1995). The corner stones of BSC philosophy lie in two common sense sayings:

- what you measure is what you get
- if you cannot measure it you cannot manage it.

Thus measurement and management virtually have become inseparable (Kaplan and Norton, 1996; Koo, 1998). The advantages of adopting BSC have been reported in numerous publications (Brown and McDonnell, 1995; Kaplan and Norton, 1996; Noci, 1995) (<http://www.bscchina.com/>, <http://www.bscol.com/>). A quadruple perspective approach to measure and manage corporate performance by BSC is more comprehensive and balanced than a mono-perspective approach merely using financial indicators (Hepworth, 1998). Financial measures are lag indicators, which are measures of historical performance. Non-financial measures are leading indicators which are the performance drivers (Kaplan and Norton, 1996; Beiman and Sun, 2003). BSC helps organisations to solve two key issues: an effective corporate performance evaluation and strategic implementation. BSC is strategic because it embraces the setting of objectives and the process involved in achieving these objectives. Kaplan and Norton (2001) point out that the essence of strategy is to enable the operations of the organisation to be different from its competitors, with unique and valuable differentiation. A sustainable strategic position requires systematic activities and they are mutually reinforcing each other. BSC is built on a series of hypotheses which constitute a strategy map. It is of paramount importance to be able to describe strategies. It has been argued earlier that what cannot be measured cannot be managed. Kaplan and Norton (2004) supplement this by saying: “you cannot measure what you cannot describe”. The following five management principles help FOCUS the strategies of an organisation:

- formulate strategies in operational terms
- organise development efforts towards strategic objectives
- change through executive leadership
- use strategies as continuous processes
- set strategies in every employee’s task.

In addition to BSC, Key Performance Indicator (KPI) and Management By Objectives (MBO) are also corporate performance measurement tools. ‘Key’ implies the most important issues to be tackled during certain strategic stages (Qin, 2005). The major drawback of KPI is the lack of a balanced appraisal dimension. BSC indicators portray a cause-and-effect chain of relationships which are mutually supportive and dependent. This causal linkage is not a concern for KPI. The rationale of MBO is based on the realisation of objectives and the process of objective setting has to be accurate and

rigorous. MBO should be integrated with budget planning, performance appraisal, wages, human resource planning and development. The relationship between performance and reward has to be established and the driving motives need to be revealed. As compared with KPI and MBO, BSC combines objectives, planning, and follow-up tasks and can coordinate, under corporate philosophies, the conflicts arising from the various management systems. The emergence of BSC has made KPI and MBO part and parcel of the BSC. BSC still retains financial performance indicators as the most important criteria and further incorporates the concept of customer focus in the performance measurement.

3 Strengths Weaknesses Opportunities Threats (SWOT)

The origin of SWOT was SOFT (Satisfactory (good in the present), Opportunity (good in the future), Fault (bad in the present), Threat (bad in the future)) which came from the research work on corporate planning conducted at the Stanford Research Institute from 1960–1970 by a research team comprising Marion Doshier, Otis Benepe, Albert Humphrey, Robert Stewart, and Birger Lie. The SOFT analysis was presented at a seminar at Zurich in 1964 and Urick and Orr changed the F to a W and called it the SWOT (Humphrey, 2005). Weihrich (1982) modified SWOT (or TOWS) into the format of a matrix, matching the internal factors (i.e., the strengths and weaknesses) of an organisation with its external factors (i.e., opportunities and threats) to systematically generate long-term strategies and/or short-term tactics and/or one-off action plans that ought to be undertaken by the organisation. Internal factors refer to those factors that can be controlled or manipulated by the organisation. These internal factors or KSFs can be determined by way of brain-storming or Nominal Group Technique (NGT). In the case study of the Hong Kong Quality Management Association (HKQMA) (details of this non-profit making professional body can be found at its website: <http://www.hkqma.org/>), the ‘Checklist for Performing Strengths/Weaknesses Analysis’ of the Marketing Guru Kotler (2000) was used to supplement the NGT exercise by the Executive Committee Members. The Kotler Checklist was slightly adjusted to take the four perspective formats of BSC (see Table 1). New items could be added to the checklist to reflect the specific business nature of HKQMA. Collectively, the management team rated their perceived importance and performance of each of these items on a Likert scale of 1 (least important or worst performed) to 10 (most important or best performed). If a large difference occurred among some of these perceived importance or performance scores, the concerned executives should state their reasons so that a compromise could be reached. The candid dialogue helped alleviate misunderstanding among the executives and fortify mutual support in subsequent strategy implementation. The measurements on perceived importance and performance generated a very useful by-product, viz. perceived performance gap. The perceived performance gaps were operationally defined as the differences between the perceived importance and perceived performance. The larger the perceived performance gaps were the more urgent it was to improve on those attributes.

Table 1 Ranking of importance of internal factors

<i>Performing strengths/weaknesses analysis</i>	<i>Importance score</i>	<i>Performance score</i>	<i>Performance gap</i>
Income (financial)	9.4	–	–
Number of members (financial)	9.0	–	–
Customer retention (customer)	8.8	–	–
Visionary, capable leadership (learning)	8.3	–	–
Customer satisfaction (customer)	8.1	–	–
Service quality (customer)	8.1	–	–
Company reputation (customer)	7.6	–	–
Flexible or responsive (learning)	7.1	–	–
Geographical coverage (customer)	6.5	–	–
Vision (learning)	6.5	–	–
Financial stability (financial)	6.4	–	–
Entrepreneurial orientation (learning)	6.4	–	–
Product quality (customer)	6.4	–	–
Sales force effectiveness (customer)	5.9	–	–
Innovation effectiveness (customer)	5.9	–	–
Promotion effectiveness (customer)	5.6	–	–
Cash flow (financial)	5.5	–	–
Ability to produce on time (process)	5.4	–	–
Technical manufacturing skill (process)	5.0	–	–
Distribution effectiveness (customer)	4.9	–	–
Pricing effectiveness (customer)	4.8	–	–
Market share (customer)	4.1	–	–
Facilities (process)	4.1	–	–
Capacity (process)	3.6	–	–
Economies of scale (process)	2.5	–	–

It is useful for the management team to know the extent of perceived importance, perceived performance and the perceived performance gaps. This is a synergetic outcome of getting three pieces of useful information by asking for two rating scores (i.e., perceived importance and perceived performance). The next step is to eliminate those internal factors which are perceived to be less important. The remaining internal factors can be reckoned as key internal factors. Naturally those which are rated subjectively as well performed items are the strengths and those which are perceived to be less well-performed are the weaknesses. The perceived performance gaps are the 'areas for improvement' with quantifiable priority.

The external factors affecting HKQMA can be revealed through a NGT (a modified form of brainstorming) exercise around the four aspects (viz. Social, Technological, Economic, Political – STEP or PEST). Those external factors which are favourable to HKQMA are termed opportunities and those which are unfavourable are threats. In order to prioritise these subjectively determined perceived opportunities and threats, an

opportunity matrix (success probability vs. attractiveness) and a threat matrix (probability of occurrence vs. seriousness) introduced by Kotler (2000), were used in a modified form. The success probability, attractiveness, probability of occurrence, and seriousness were subjectively and collectively rated on a Likert scale ranging from 1 to 10. Similar to the earlier arrangement, if large differences occur among some of these scores, the concerned executives should give supporting reasons for their scores. Instead of depicting these external factors on a two dimensional diagram, opportunity ranking scores (product of the perceived success probability and attractiveness) and threat ranking scores (product of the perceived probability of occurrence and seriousness) are computed and ranked (Table 2).

Table 2 Ranking of importance of external factors

<i>External factors (O = Opportunity; T = Threat)</i>	<i>Probability of occurrence</i>	<i>Impact magnitude</i>	<i>Importance score</i>
O1. Lack of recognised certification scheme in HK	6.7	+8.0	54
O2. The growing demands of quality service	6.4	+7.9	51
O3. Quality Assurance Inspection (QAI) by the HK Govt	6.6	+7.0	46
O4. Lack of operational standards for SMEs	6.9	+6.4	44
O5. The cooperation between China, HK and Macau	6.1	+6.9	42
O6. Availability of SME grants	4.4	+7.1	31
O7. Popularity of the internet	4.7	+6.3	30
O8. Government recommendations for high-tech	3.1	+4.3	13
T6 Deployment high-tech	3.9	-4.1	-16
T5 Growing competitions	5.4	-4.6	-25
T4 Less support from HK Govt	5.7	-6.0	-34
T3 Retrenchments of corporate members	7.6	-7.9	-60
T2 Economic recession	7.7	-7.9	-61
T1 Individual financial deterioration	7.7	-7.9	-61

The SWOT matrix matches the external factors with the internal factors. The positive impacts from favourable factors (strengths and opportunities) are maximised and the negative influences from unfavourable factors (weaknesses and threats) are minimised. These are depicted in Table 3 as: maxi-maxi SO; mini-maxi WO; maxi-mini ST; and mini-mini WT. It is better to label each strength, weakness, opportunity, and threat as S1, S2, S3, ... for different strengths; O1, O2, O3, ... for the various opportunities; and so on. In the maxi-maxi SO quadrant, S1O2 represents the outcome (i.e., the action item that the organisation should undertake to perform in the light of the prevailing circumstances) from matching strength 1 and opportunity 2. This kind of matching continues for the remaining of all internal and external factors, with similar possible outcomes group together, such as S1S2S3S4S5S6O1O4 (S1–S6O1O4). The reasons why SWOT matches internal factors with external factors are obvious. Firstly, matching external factors (e.g., opportunities and threats) are meaningless as both are beyond the control of the organisation concerned. Secondly, internal factors (i.e., strengths and weaknesses) are not matched among themselves because, in the absence of specific external stimuli, the improvement direction for future development is purposeless.

Table 3 SWOT matrix of HKQMA

<i>HKQMA</i>	<i>Strengths</i>	<i>Weaknesses</i>
<i>SWOT analysis 2002–2003</i>	S1 Financially stable (financial) S2 Good geographical coverage (customer) S3 Good Company reputation (customer) S4 High Product quality (customer) S5 Visionary, capable leadership (learning) S6 Entrepreneurial orientation (learning) –	W1 Unclear vision (learning) W2 Low income (financial) W3 Service quality not too well (customer) W4 Not flexible or responsive enough (learning) W5 Low customer satisfaction (customer) W6 Low number of members (financial) W7 Low customer retention ability (customer)
<i>Opportunities</i>	<i>Maxi Maxi SO</i>	<i>Mini Maxi WO</i>
O1 Lack of recognised certifications scheme in HK	S1-S6O1O4 Organise local professional exam	W2O1 Apply ISO certification for HKQMA
O2 Growing demands for quality service	S1-S6O2O4 Establish service index	W3W5W6W7O2 Enhance service to members
O3 Quality Assurance Inspection (QAI) scheme with SAR Government	S1-S6O4O3 Provide professional award scheme	
O4 Lack of operational standards for SMEs	S1-S6O4 Expand service to the greater China region	
O5 Closer cooperation between China, HK and Macau	S1-S6O2 Promote QCC to schools in HK	
<i>Threats</i>	<i>Maxi Mini ST</i>	<i>Mini Mini WT</i>
T1 Individual financial deterioration	S3S5S6T1-T3 Enhance consultancy service	W1W2W5W6T1-T3 Enhance life-long learning service to members/potential members
T2 Economic recession		
T3 Cost reduction by corporate members		

Feurer and Chaharbaghi (1997) define strategy as the determination of the basic goals and objectives of an enterprise and the adoption of courses of action and the allocation of resources necessary for carrying out these goals. Put simply, strategy is the means to achieve important and long-term corporate objectives. A meaningful objective should be: Specific, Measurable, Achievable, Result-oriented, and Time-bound (i.e., SMART) (see Table 4).

Basing on this definition of strategy, which sequence of events should be adopted? Should we first start with the objectives and then work out the SWOT analysis? Or should we work out the SWOT analysis first and then determine the SMART objectives arising from matching of the internal and external factors? A pragmatic and rational approach should be hierarchical. For the highest level of corporate strategy there should not be any pre-determined objectives which otherwise may restrict the organisation when adapting to the changes in external environment. However, when the

corporate strategies are determined by the SWOT analysis, the subsequent SWOT analyses by its subsidiaries and departments should be guided by the top level strategic objectives. This will help align the efforts from all units within the group and yield synergetic benefits. In conducting SWOT analyses at the lower levels, considerations must be given to the corporate objectives, i.e., what internal strengths and weaknesses would the concerned units have and what external opportunities and threats would they face in supporting the achievement of corporate goals. Using this hierarchical approach, the utilisation of resources and employee efforts can be aligned.

Table 4 The SMART objectives of HKQMA

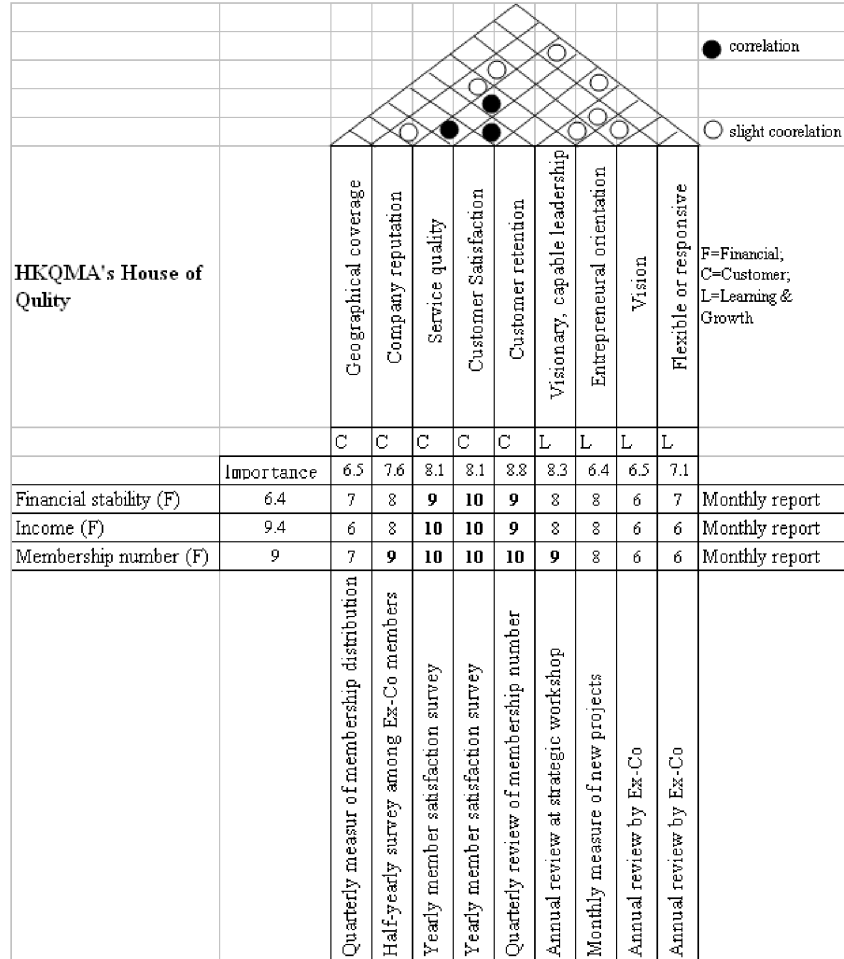
<i>Matrix items</i>	<i>Strategies identified from SWOT</i>	<i>SMART objectives</i>
S1-S6O1O4	Organise local professional examination in quality management	Organise the first exam by 2004 with at least ten organisations participating
W3W5W6W7O2	Enhance membership service	Improve membership service so as to increase 50 individual members and 15 corporate members in 2003
W1W2W5W6T1-T3	Life-long learning for members	To launch a comprehensive range of courses from certificate to doctoral levels by 2004
S1-S6O4O3	Develop Quality Award for SMEs	To propose award criteria by end of 2003
S1-S6O2	Promote QCC to schools	Promote QCC to at least 20 schools in HK by 2003
S1-S6O2O4	Develop service index	Prepare a criteria proposal by 3 qtr, 2003 and to launch the program by 2004
S3S5S6T1-T3	Improve consultancy service	To earn at least HK\$30,000 in 2003
S1-S6O4	Extend service to greater China	To increase 10 members from outside HK in 2003

4 Quality Function Deployment (QFD): the House Of Quality (HOQ)

The QFD has been widely used in the manufacturing sector for decades. QFD links up manufacturing design directly with the voice of customers (Akao, 1990). QFD is defined as a system which translates the customer needs into the requirement of every process undertaken by the organisation, from research, product design and development, to production, distribution, packaging, marketing sales and services (ASI, 1987).

Burn (1994) describes QFD as a comprehensive method to enable every employee in the organisation to contribute to the achievement of corporate goals. QFD is a detailed system for translating the needs and wishes of the customers into design requirements for product and service and it focuses on delivering value by understanding customers' requirements and then deploying these customer expectations throughout the development process (Terninko, 1997). QFD can be used to develop corporate strategies (Crowe et al., 1996) the voice of customers provides useful guidelines for the corporate business focus and in this respect, the top management is the internal customer of the QFD. As the QFD matrix resembles the shape of a house, it is also known as the HOQ (Figure 1).

Figure 1 The House Of Quality (HOQ) for HKQMA



5 A case example on BSQ by the HKQMA

5.1 BSQ strategic model

This is a holistic strategic model by integrating the BSC, SWOT and QFD approaches. Being a non-profit making organisation, the HKQMA has been established over two decades. Its mission is to promote the theory and practices of management in quality excellence in the Greater China (<http://www.hkqma.org.hk/>). Every year the Executive Committee holds its strategic workshop to set relevant strategies for the ensuing year. The BSQ approach was first successfully adopted in 2002.

The followings are the procedures in adopting BSQ model, which can be used as a reference by other organisations:

Step 1: Use Nominal Group Technique (NGT) to scan the external environment

The NGT is an improved format of brainstorming. All participants were allowed some time (say, 10 minutes) to think over the issue assigned on an individual basis. They could jot down their ideas/suggestions. They were then asked individually, in turn, to read out their points (i.e., round robin). When one had exhausted his points, he could pass simply to the next one and he could again contribute in the later rounds when new ideas sparked after hearing what the other had said. Like in the brainstorming session, during the course of ideas solicitation no query or criticism would be made. The round robin would cease when no further idea could be generated by anyone in the group. The NGT had some advantages over the brainstorming. Firstly, all participants were allowed sometime at the beginning to organise their thoughts on the subject and secondly everyone was allowed a fair chance to express his/her ideas to avoid the session being dominated by a few outspoken members. Then the various ideas were discussed, reviewed and categorised. The participants were reminded to scan the external environment via four perspectives viz. Social factors, Technological factors, Economic factors, and Political factors (i.e., using STEP or PEST acronym).

Step 2: Subjective prioritisation of external factors into opportunities and threats

Broadly speaking, external factors are those that are beyond the control of any individual organisation and yet are affected by these factors either favourably or unfavourably. Favourable external factors are opportunities and unfavourable factors are threats. Factors which are neither likely to affect the organisation nor strong in magnitude can be ignored. The 'genuine' perceived opportunities and threats are systematically determined, collectively and openly, among the executive members. Each factor identified through the NGT exercise is rated on a scale of 1 to 10 on the probability of occurrence (1 being the most unlikely to occur, ..., 10 being the most likely to occur) and on the impact magnitude (+1 being the least favourable impact magnitude, ..., +10 being the most favourable impact magnitude; similarly -1 being the least unfavourable impact magnitude, ..., -10 being the most unfavourable impact magnitude) individually by all participants. When a large discrepancy occurs among the ratings, participants are encouraged to explain their reasons. This open and democratic arrangement will help bridge any communication gap and build up rapport and team cooperation during the implementation stage.

The arithmetic means of the probability of occurrence scores are multiplied by the arithmetic means of impact magnitude scores to generate the importance scores. Positive 'importance scores' signify favourable external factors, also known as opportunities. Negative 'importance scores' signify unfavourable external factors, also known as threats. The executive committee then decided which external factors should be ignored. After some discussions, it was agreed that those items with absolute importance scores less than 40 should be dropped (the shaded items in Table 2).

Step 3: Subjective prioritisation of internal factors into strengths and weaknesses

The 'Checklist for Performing Strengths/Weaknesses Analysis', by Kotler (2000), was used as a basis for developing a preliminary organisational health checklist. If the business nature of the concerned organisation is unique, more relevant factors (e.g., number of members and income) can be added to the list. Table 1 was modified from Kotler's (2000) checklist, based on the discussion among the executive committee

members. The corresponding BSC perspective descriptions are bracketed after each internal factor. The importance of each factor was then rated subjectively and collectively on a scale of 1 to 10 (1 being most unimportant, ..., 10 being most important). Where large differences in rating scores occurred, they were encouraged to explain the reasons. These candid discussions actually improved mutual understanding among the members of the management team. The arithmetic means were computed and sorted in descending order. Factors with means below 6.4 were perceived to be relatively unimportant and would be deleted in determining the strengths and weaknesses. Strengths are important internal factors (i.e., KSFs) which the organisation has been performing well. Alternatively, weaknesses are important internal factors (i.e., Key Failure Factors) which the organisation has been performing badly, in a relative sense. It is interesting to note that because of their unique business nature, 'process' factors were all relatively unimportant to the HKQMA and were omitted.

The management team then rated the performance of the remaining 13 'perceived important' internal factors on a scale of 1 to 10 (1 being least well performed, ..., 10 being best performed). A useful by-product could be obtained by operationally defining 'performance gaps (or areas for improvement) as the difference between the perceived importance and the perceived performance of each internal factor'. The major performance gaps for HKQMA are: Customer retention, Number of members and Income.

As the items listed in Table 5 are all important to the success or failure of HKQMA, the relatively well performed factors are 'strengths' and those relatively less well performed factors are 'weaknesses' (see Table 6). Together with the external opportunities and threats identified in Table 2, these systematically derived strengths and weaknesses can be used in the SWOT analysis.

Table 5 Importance, performance and gaps for HKQMA internal factors

<i>Performing strengths/weaknesses analysis</i>	<i>Importance score</i>	<i>Performance score</i>	<i>Performance gap</i>
Income (financial)	9.4	6.3	3.1
Number of members (financial)	9.0	4.3	4.7
Customer retention (customer)	8.8	4.0	4.8
Visionary, capable leadership (learning)	8.3	6.9	1.4
Customer satisfaction (customer)	8.1	5.6	2.5
Service quality (customer)	8.1	6.3	1.8
Company reputation (customer)	7.6	7.0	0.6
Flexible or responsive (learning)	7.1	6.0	1.1
Geographical coverage (customer)	6.5	7.1	-0.6
Vision (learning)	6.5	6.4	0.1
Financial stability (financial)	6.4	7.8	-1.4
Entrepreneurial orientation (learning)	6.4	6.8	-0.4
Product quality (customer)	6.4	7.0	-0.6

Table 6 Internal strengths and weaknesses of HKQMA

<i>Internal measures</i>	<i>Importance score</i>	<i>Performance score</i>	<i>Performance gap</i>
<i>Strengths</i>			
S1 Financial stability (financial)	6.4	7.8	-1.4
S2 Geographical coverage (customer)	6.5	7.1	-0.6
S3 Company reputation (customer)	7.6	7.0	0.6
S4 Product quality (customer)	6.4	7.0	-0.6
S5 Visionary, capable leadership (learning)	8.3	6.9	1.4
S6 Entrepreneurial orientation (learning)	6.4	6.8	-0.4
<i>Weaknesses</i>			
W1 Vision (learning)	6.5	6.4	0.1
W2 Income (financial)	9.4	6.3	3.1
W3 Service quality (customer)	8.1	6.3	1.8
W4 Flexible or responsive (learning)	7.1	6.0	1.1
W5 Customer satisfaction (customer)	8.1	5.6	2.5
W6 Number of members (financial)	9.0	4.3	4.7
W7 Customer retention (customer)	8.8	4.0	4.8

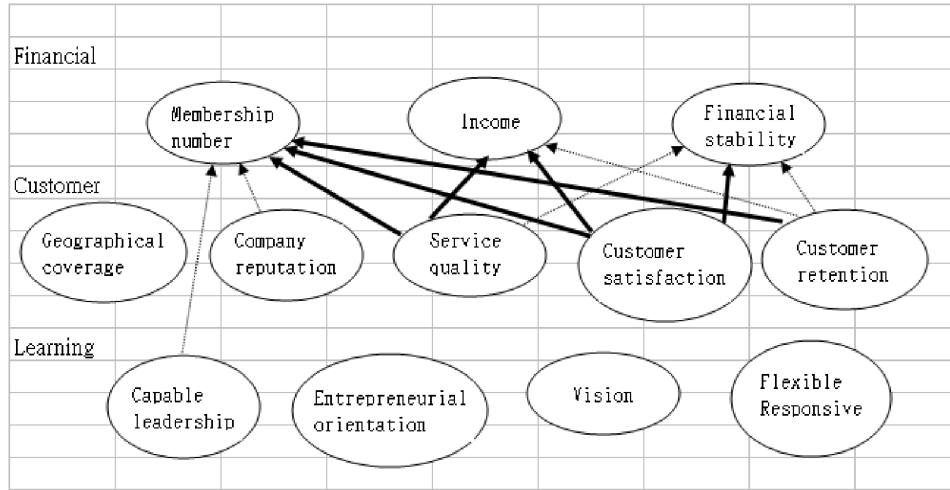
Step 4: Constructing the SWOT matrix

The internal factors and external factors are matched pair by pair, with positive impacts (i.e., from Strengths and Opportunities) maximised and with negative impacts (i.e., from Weaknesses and Threats) minimised. The rational responses to the combinations of internal and external factors were summarised in the four quadrants, i.e., Maxi-Maxi SO; Mini-Maxi WO; Maxi-Mini ST; and Mini-Mini WT. As we are in an era of changes, the SWOT analysis should be conducted at least annually and as and when major events which would affect the organisation, have occurred. Thus, SWOT analysis should be 3-dimensional with time as the third dimension.

Step 5: Building the HOQ (QFD)

The cause and effect linkages among the financial measures (as lagging indicators) and the non-financial measures (as the leading indicators) are important in explaining the sequence of hypotheses between the outcome measures and the performance drivers of those outcomes. Every BSC measure should be an element of a chain of cause-and-effect relationships that communicates the meaning of the business unit's strategy to the organisation (Kaplan and Norton, 1996). In this respect, the QFD can help to establish subjective casual relationships among the internal financial vs. non-financial factors. The importance scores in Figure 1 come from Table 6. The magnitudes of the causal relationships range from 1 to 10 (10 being the strongest perceived cause and effect relationship). The solid and empty circles in the 'roof-top' represent the degree of correlations among some of the non-financial measures. The BSC measures are shown in the lower portion and the right-hand portion of the HOQ. The QFD enables a succinct way of depicting the relationship among the internal factors. The perceived causal relations with magnitudes over 8 are italicised. These strong cause and effect relations will be represented by thick (for 10 point magnitude) and dotted (for 9 point magnitude) lines respectively in Figure 2.

Figure 2 The cause and effect relationships among the BSC measures



The relationships among the key internal factors are represented in the format of a BSC. It is interesting to note that there are no BSC measures for internal processes due to its unique business nature as a professional body manned by a group of quality enthusiasts, who are not employees of the association. Services can be outsourced as and when required. HKQMA’s main responsibility is to ensure the quality standards.

Step 6: Prioritising the strategies and setting SMART objectives

The strategies identified from the SWOT analysis need to be prioritised. This can be accomplished with the use of the pairwise comparison method as shown in Figure 3. After some discussions, the strategy of applying for ISO certification was dropped because of low priority. SMART (i.e., Specific; Measurable; Achievable; Result-oriented; and Time-bound) objectives were set and agreed upon.

Figure 3 Ranking of HKQMA strategies

Pair-wise comparison		a:	b:	c:	d:	e:	f:	g:	h:	i:	Priority order
a: Organize local prof exam	a:										8
b: Develop service index	b:	a									3
c: Develop Quality Award for SMEs	c:	a	c								5
d: Extend service to greater China	d:	a	b	c							1
e: Promote QCC to schools	e:	a	e	c	e						4
f: ISO certification for HKQMA	f:	a	b	c	d	e					0
g: Enhance membership service	g:	a	g	g	g	g	g				7
h: Improve consultancy service	h:	a	b	c	h	e	h	g			2
i: Life-long learning for members	i:	a	i	i	i	i	i	g	i		6

In order to link up the HOQ with the respective strategies, the HOQ in Figure 1 can be modified as shown in Figure 4.

This modified HOQ is then combined with the strategies to become the Double HOQ (see Figure 5). The numbers embedded in the matrix in Figure 5 represent the perceived cause and effect relations between the internal factors listed on the left-hand side of the HOQ. The strategies are listed on the upper part of the HOQ. The causal relations can be bi-directional, i.e., the internal factors can cause the successful implementation of the respective strategies, and on the other hand, the successful implementation of any specific strategy can contribute to the internal factors. The numbers underlined represent a cause and effect impact by any specific internal factor on the strategy (e.g., company reputation has a very strong impact on successful launch of local professional examination). Similarly if the launch of QCC in schools is successful, it would have a major positive contribution to internal factors like, financial stability and income.

The term 'Double HOQ' is coined here to explain the fact that two otherwise disjoint HOQs are merged effectively to depict the various perceived casual relationships.

6 Conclusion

The case example of the HKQMA has been used to illustrate how three powerful strategic tools viz., BSC, SWOT, and QFD have been fused effectively and seamlessly as a new holistic strategic formulation technique which should have wide applications in many organisations.

This new holistic model is called the 'BSQ model (acronym for the three traditional strategic tools that make up the model). The BSQ approach has the following EFFECTIVE advantages:

- *Effective integration of BSC, SWOT and QFD to yield synergetic benefits*
- *Flexible to adapt to changes in external challenges*
- *Fair and open approach during the development stage*
- *Easily understood by all concerned within the organisation*
- *Communication enhancement within the organisation*
- *Team-based approach to ensure smooth implementation of strategies*
- *Imbedded opportunities to clarify different views to avoid misunderstanding*
- *Very simple and easy to apply, as no sophisticated mathematics is needed*
- *Examining and quantifying the real internal and external factors systematically.*

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