

A TYPOLOGY OF STRATEGIC ENVIRONMENTS EXTRACTED FROM A CROSS-TABULATED SWOT ANALYSIS MODEL

Peter J. Stavroulakis*, Dr. Elena Riza

Department of Hygiene, Epidemiology & Medical Statistics, Medical School of Athens, M. Asias 75, Athens 11527, Greece

*pjstav@med.uoa.gr, eriza@med.uoa.gr

ABSTRACT

From the plethora of instruments concerned with strategic management, one may be easily led to remark that SWOT analysis surfaces as the most resilient of techniques, for it is a readily available methodology facilitating the formulation of an effective strategic framework through situation analysis. Although to this day its origin remains obscure, it has proven time and time again to be the strategic instrument of choice for over half a century and for a good reason: SWOT analysis provides a concise snapshot of the strategic environment involving the case at hand and at the same time hints towards strategic directions that should be pursued in order to achieve strategic might. Cross-tabulation on the other hand, provides a methodology from which we can extract an interrelation of causality between categorical data. We investigate the applicability of epidemiological instruments (including but not limited to measures of association) to strategic management topics. From the model formulated, a typology of strategic environments is proposed and can be utilized in order to categorize strategic ventures according to the external environment wherein they are operating (or are about to operate). This work proposes a novel approach concerning SWOT analysis, implicating a correlation of the methodology concerning the critical and analytic review of strategic factors with methodologies contained in epidemiology. The procedure of typology formulation and cross-tabulation can be applied in other cases of study, thus expanding the scope and applicability of SWOT analysis even further.

Keywords: Cross-tabulation, SWOT analysis, strategic environment, strategic management

1. Introduction

A review of the background concerning situation analysis and epidemiological instruments with respect to cross-tabulation is produced and certain cases of interest concerning the utilization of SWOT analysis and the manipulation and/or extension of its traditional form are presented. The presentation and analysis of the two will facilitate towards the explanation of the latent parameters underlying the fusion of the two methodologies, or rather the extraction of methodological instruments derived from epidemiology and their application to strategic management cases, through the instrument of SWOT analysis.

2. Methodological Components

The basic pillars of the model formulated are presented, first through a critical overview of the SWOT method and thence through the examination of pertinent epidemiological extracts that will be utilized in order to produce the model introduced herein and by extension, the typology of strategic environments.

2.1 Situation Analysis

Situational analysis is the first step of strategic management. Without a thorough understanding of our environment, both internal and external, no planning can be fruitful, no mission substantiated and no vision sustained. Even if we agree with the applicability and effectiveness of SWOT analysis or not, its underlying principles are so self-evident that they are inherent in any venture. It is of eminent importance to be able to understand who we are, our competences and limitations, as well as how these particular characteristics will fit outside our external organizational or systemic boundaries; as most systems we are in charge of, organizations are open entities and highly dependent on their environment. A system with null dependency on its environment is sterile and isolated; dead.

Distinctive competencies and sustainable competitive advantages can only surface whence we administer a thorough and comprehensive analysis of how our internal environment will detect and conserve a propitious niche graciously harmonized with its environment [28]. This in particular is the distinctive competence of the SWOT analysis itself. Beyond polemics regarding its validity, it was created (and remains) as a practical instrument of self-awareness and aspiration, where “self” can be our system of focus, our firm, organization or even person and aspiration can be the intrinsic belief or hope that the potential of the self will be utilized in order to move one step closer to our dreams. Situation analysis unwittingly reconciles the gap between what we can (internal environment) and what is allowed (external environment). Along with what we are obliged (ethics, legislature, corporate responsibility) and what we want (corporate culture, values, beliefs), the primal dimensions of a strategic decision are formulated.

2.1.1 SWOT Analysis Applicability

SWOT analysis involves the expression of an inventory of two elements of internal origin, strengths and weaknesses and two elements of external origin, opportunities and threats. The versatility and benefit of this instrument is seen at first glance, for it can be utilized for any basis of analysis, where the user can specify the level of systemic focus desirable. The only constraint that is inherent in SWOT is exactly that; it requires a system with clear boundaries from its environment, for said analysis will facilitate the formulation of particular strategies for the explicit system always with respect to the environment it's operating in. We could conjecture that this particularity is the cornerstone of the viability of SWOT, for it pertains to a holistic and systemic approach of any entity. The fact that this methodology can readily provide an overview of the basic factors affecting a particular system, gives it a basic advantage among the strategic management instruments [12], but at the same time there arises an issue of objectivity and comparison of factors [24]. In a traditional SWOT analysis a list-view of factors is portrayed, erroneously implying that each factor may (or does) hold the same weight as the other. Over the years, several instruments and methods charged with the mitigation of this issue have been implemented.

2.1.2 Overview of Recent Literature Utilizing SWOT Analysis

An initial overview of the recent utilization of SWOT analysis portrays a wide range of applications, from environmental and industry-wide, to classic organizational assessment. Collectively administering a critical overview may hint as to why this instrument is so popular and prevalent; as mentioned above, the key of its excellence is its versatility; still it is a very interesting topic of research providing a plethora of research potential, whereas the methodology as-is can be utilized from any perspective wherein a critical strategic analysis of a system is required. As a topic it could be stakeholder decision making on complex socio-ecological systems [6]

where SWOT is utilized as a methodological assessment instrument, or it can be utilized for the socioeconomic assessment of the commercial weather vane scallop fishery off Alaska [9], whence through this methodology clear directions and recommendations can become evident.

In another study [27] SWOT is teamed up with systems' analysis in order to assess a World Health Organization programme concerning global violence and injury prevention. In [19] the necessity of tacit knowledge with respect to the training of environmental health is assessed with this instrument, whereas Liu et al [16] address the decision path for the construction of a low-carbon city construction within the framework of the Chinese constructional path. Chong [5] utilizes SWOT analysis to assess the situational characteristics of the Malaysian cruise industry and Braun and Amorim [3] address primary information from field diagnosis and consultation with local stakeholders with SWOT analysis in order to inspect environmental impact of different practices and phenomena within a specific region. Öztürk [20] utilizes a ranking SWOT analysis (R'WOT) in order to extract strategies with respect to the environmental conservation of a specific region and Prezelj [21] utilizes a quantitative SWOT analysis to explain a division between the strengths and weaknesses of inter-organizational cooperation within the anti-terrorism field.

Through a different focal perspective, Manzano-García and Ayala-Calvo [17] utilize the instrument to provide a global overview of the strategic factors affecting the nursing industry. Mphasha [18] utilizes SWOT analysis in order to portray the impact of folktales for strategy formulation of cultural heritage. Raslavičius et al [22] provide a developed SWOT analysis with respect to electric vehicles situational parameters within the Baltic region. Sharma and Singh [23] provide a complete analysis of ICT utilization and potential within the framework of six universities in India. From anti-terrorism to folktales, the scope of applications wherein this instrument finds pertinence seems endless.

2.1.3 Instruments Based on SWOT Analysis

The trials and tribulations of the traditional SWOT have seen the manifestation of novel instruments, differentiating themselves from the caveats of the original, but simultaneously attempting to sustain its strengths. Kurttila et al [14] paired the decision analysis tool AHP (analytic hierarchy process) with SWOT in order to bypass some weaknesses of the generic SWOT, whereas Stewart et al [26] provide the same solution to the expectance of an analytical method to prioritize the strategic factors of the SWOT analysis. Gao and Peng [7] present a quantified SWOT analytical method based on the multiple criteria group decision-making (MCGDM) concept. Kuo-liang and Shu-chen [15] provide a fuzzy quantified SWOT to evaluate strategic environments. Hadighi et al [10] introduce a three phase clustering algorithm to a SWOT analysis framework. Along with the scope comes the modifiability of the instrument; again, it seems vast.

2.2 Extracts from Epidemiology

Since the discipline of Epidemiology as defined by Last [2] is "the study of the distribution and determinants of health-related states or events in specified populations, and the application of this study to the prevention and control of health problems", we observe two parameters of interest for this work; initially what could be defined as a specified population and thence what could consist of prevention and control of a health problem. If we adjust the scope of the specified population to an organizational unit and take under consideration the World Health Organization's definition of health as the "state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" we can apply this definition under the selected unit of study and we can glimpse at the potential offered through epidemiology. Simultaneously we may hazard the conjecture that specific instruments of epidemiology utilized to measure causality, to monitor a disease and by extension prevent it, could be applied effectively to organizational management, a discipline that from conception has been expanding in ideas that further efficiency, manage and/or minimize disorder.

Originating from the definitions above, we may propose that epidemiology can as well be instituted as an organizational management application, for the scope of this discipline is concretely adjacent to management. Epidemiology is the systematic application of methodologies in order to prevent and/or treat disorder; to lead through analysis to the optimum decision with respect to a collective group of individuals, but so is management science, from its birth. Disease (as disorder) can include a range of occurrences and epidemiology can be called upon to provide effective solutions in topics ranging from corporate inefficiency to distracted driving [13].

Despite its insurmountable differentiations, it is very consoling that in the face of adversity, whether it is a financial crisis or a viral epidemic, science is united in providing effective solutions for the world based in transparency, efficient communication and trust [29].

2.2.1 Epidemiological Instruments

Epidemiology can be directly linked with economic impact [11]; simultaneously it can be accepted as the dynamic body of knowledge currently addressing issues of personalized health, well-being and prevention [25]. Particular case-control studies [1] are in use and popular for a good reason; despite several types of potential bias and confounding that can be assessed a posteriori with a meta-analysis and/or a systematic review as with other instruments [8] along with better planning [4], they provide a very valid and reliable instrument. Contingency tables in their two by two form are utilized extensively in these types of studies as they provide the basis of analysis of the interrelation of two variables of categorical data, the disease and the risk-factor.

2.2.2 Cross-tabs and Measures of Association

Concerning a basic cross-tab, the critical factor is the association of exposure and disease (risk). By correlating exposure with disease we are able to extract a near-definite outcome as to the etiology of the disease. Let us consider a basic two by two construct (Figure 1, second part). In a general scenario, there are two categorical variables each of which can be contained in one of two states. The two distinct states are exposure (and in-exposure) with respect to a specific factor and the presence (or absence) of a specific condition.

The typical measures of association that will interest us herein are the attributable risk ($AR = \text{difference between exposed and unexposed with condition present} = a - c$) the risk ratio ($RR = \text{attack rate for exposed to attack rate for unexposed} = a \cdot (c + d) / c \cdot (a + b)$) and the odds ratio ($OR = \text{exposure within the condition to that of the absence} = (a/c) / (b/d) = a \cdot d / c \cdot b$).

3. Model Formulation

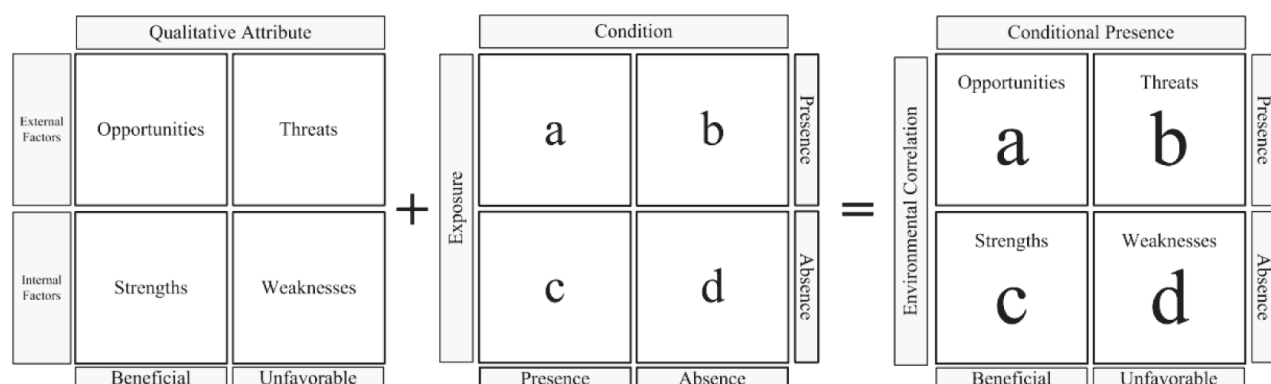
The formulation of the model is presented, along with an indicative calculation and a proposed typology of strategic environments.

3.1 Fusion of SWOT and Crosstabs

The generic SWOT analysis (as seen in the first part of Figure 1) can be paired up with a rudimentary cross-tab in order to provide the added aspects of the epidemiological perspective. External factors can be simulated with exposure, since exposure implies a derivation from the external environment; opportunities and threats can be a result of systemic exposure.

The condition (at this point the model may diverge from the generic case-control crosstab, wherein the condition is considered a disease, though this is not always the case) can be unified with the qualitative attribute that can be either beneficial or unfavorable. Within this rationale, strength can be considered the presence of a (favorable) condition without exposure to the external environment, whereas a threat can be regarded as the absence of a (favorable) condition deriving from the external environment (exposure).

Figure 1. Fusion of SWOT and a crosstab.



Since the main disadvantage of the traditional SWOT is the absence of an analytical methodology, utilizing a quondam calculation on ranking or appraisal of strategic factors, the crosstab can be compiled. Once we have numerical values signifying the ranking (or numeration) of the specific strategic factors we are able to proceed to the calculation of measures of association. The different measures will portray a different dimension with re-

spect to the strategic environment. The attributable risk will show the difference of opportunities and strengths; a large AR may denote a very favorable external environment with respect to beneficial outcomes and/or a lack of beneficial internal factors.

The risk ratio will portray the favorability of the environment with respect to the internal capabilities of the system. A calculation of a RR of 1 will denote that the system has the same exact rhythm with its environment, whereas a ratio greater than 1 will indicate a more dynamic environment with respect to the system. Whence the odds ratio is calculated, it will denote the impact of the external environment in creating favorable. Through these calculations a diverse typology of environments can be formulated.

3.2 Strategic Environment Typology

We would propose that a typology of strategic environments can be created based on a particular measure of association. For example, let us choose the RR. It signifies the environmental potential to the system's potential. If it is found equal to 1, thence the environment can be categorized as harmonic (or the system as harmonized). If a result of over 1 is generated, the strategic environment can be categorized as potent or fertile, and if we result in less than 1, it can be considered as hostile or barren.

3.3 An Example Utilizing the Model

As an example whose intake data is extracted from [14], we may add the overall priority of the strategic factors according to which dimension they belong, to render the figures of $S=0.267$, $W=0.155$, $O=0.496$ and $T=0.083$ that give an ensuing calculation of an $AR=0.496-0.267=0.229=22.4\%$ a $RR=0.496/0.267=1.85$ and an $OR=(0.496*0.155/0.267*0.083)=3.5$. These results indicate a potent strategic environment, wherein the firm may have to keep up with its dynamic.

4. Conclusions

The model may prove useful in calculating a diverse range of analytics, for it can accept as intake any method of calculation, so long as it produces a numeric result; the model is unaware and indifferent of how we collected, analyzed and extracted the calculatory intake. Depending on the objectivity of said calculations, the meta-calculations that the model will provide will favor any balance already chosen. Limitations of the model proposed herein are numerous; its main constraint is that an initial calculation is required in order to provide it with the basic data, that may within itself be erroneous; the model could prove to succumb to errors in the original data, so it may be prone to error propagation, for it will convey random error as well as any bias (systematic error) contained within the raw data. Despite any limitations, cross-tabulation methodologies may be applied to concepts in strategic management such as quantified SWOT analyses. For a future direction we would suggest further examination of epidemiological instruments that may prove useful to management science, as the assessment of the applicability of incidence and prevalence with respect to organizational issues, concepts/instruments of causality and causation applied to organizational management and the extraction of epidemiological typologies and models that are directly applicable to management science.

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