

## A NEW PROCESS OF COMPETITIVE STRATEGY FORMULATION AND ITS APPLICATION TO A HOSPITAL

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### ABSTRACT

*This article reports the methodology, based on the Fields and Weapons of the Competition model (CAC), which was used to investigate the factors that determine the competitiveness of five major hospitals in the city of São Paulo and also to formulate a competitive strategy for Hospital Nossa Senhora de Lourdes (HNSL). In this model, the competitive strategy of the business is represented by the fields of the competition, such as price and product quality, and the operational competitive strategy, by the weapons of the competition, found in the activities performed or the resources managed by a group of employees with homogeneous functions. The CAC model, which is analog, symbolic, qualitative and quantitative (it uses mathematical variables) generated a methodology that proposed strategies that increased the competitiveness of HNSL. The scientific contribution of this paper is to present an innovative quantitative methodology for the analysis of the sector's competitiveness and to formulate the competitive strategy for a hospital.*

**Keywords:** *Competitive strategy. Competitive advantage. Fields and weapons of the competition.*

### 1. INTRODUCTION

This article reports the study conducted with the objective to test the new competitive strategy formulation process and of competitiveness increase prescribed by the fields and weapons of competition model (CONTADOR, 2008). A hospital was chosen to test the use because hospital segment is of an increasingly high complexity. The test was conducted at Hospital Nossa Senhora de Lourdes (HNSL) which is a big hospital in São Paulo. Since factors' identification is part of that process which determines the competitiveness in its kind of segment, it was necessary to investigate five important hospitals in São Paulo, which were HNSL's competitors.

From now, it must be mentioned that the process prescribed by the fields and weapons of competition model (CAC) aims to formulate a business competitive strategy and operational competitive strategies that promote competitive advantage to company related to their competitors and increase its level of competitiveness. According to Contador (2008), CAC was epistemologically validated by means of several applications to companies of several sizes and types, industrial and services, but the process of formulation of prescribed strategy has not still been validated by him, because applied few times - only the study from Meireles da Costa *et al.* (2007) was found during the literature review. Thus, there was the natural scientific curiosity to evaluate the efficacy, weaknesses and difficulties of the competitive strategy formulation process prescribed by CAC, and ultimately, to acquire knowledge on a new instrument of competitive advantage approach.

Notwithstanding, the process was tested at a hospital, the exposed here is applied to the formulation of any company strategy inserted within a competitive environment.

CAC, is at the same time an analogical (represents companies' competitiveness), symbolic (it has mathematical variables), qualitative (it has qualitative concepts) and quantitative model (it works with mathematical variables) model, that generated a process that proposed strategies able to increase HNSL competitiveness. It is already important to mention two of CAC analogies: the business competitive strategy is represented by competition and supporting fields for each pair product/market, and the operational competitive strategy, by the competition weapons and respective intensities.

The qualitative pillar of the process is based on the variable: weapon intensity (power and range of a weapon or level of efficacy of weapon resources' usage), focus (measure of the application of efforts on weapons that provide competitive advantages), dispersion (measure of the application of efforts that do not provide competitive advantages), achievement (difference between the foci and dispersion of weapons within a field of competition) and competitive power (average of the foci of a set of fields from the competition and support fields).

The application of the competitive strategy formulation process prescribed by CAC led to the need of considering three types of distinct clients in this case: health plans operator, doctor and patient, who must need to be adequately attended and have conflicting interests, what makes very complex the competitive strategy of a hospital.

Although the process has been applied to the several business sets of the HNSL, this article only reports its application to the Child's Hospital, which is a business unit responsible for maternity home and high complexity infant treatments and surgeries. This sector demands knowledge and equipment enough specialized for premature babies and treatment of more complex problems holders, like Neonatal ITU.

The process includes the analysis of the Child Hospital from major five hospitals in São Paulo city in order to understand how they compete and each's strategic positioning. In the article, the Child's Hospital is generally called maternity or hospital, and Nossa Senhora de Lourdes, HNSL or Hospital.

### *1.1 Scientific relevance and contribution*

In order to understand the scientific relevance and contribution of the study, it is suitable to evoke the thought on business strategy evolution in the last years.

The 1980's was distinguished by competitive strategy and competitive advantage from Michael Porter, that was perspicacious to notice the importance of the external environment of business and its position within that environment. In 1979, Porter presented "the five competitive strengths which determine industry profitability" (PORTER, 1979, 1980). Later, the concept of competitive advantage was spread (PORTER, 1985). Since then, he exerted strong influence on academic and business environment.

The prevalence that Porter assigned to company's external factors to explain the business competition, brought opponents in the 1980 and 1990s decades, many of them aggregated in RBV (*Resource Based View*, named by Wernerfelt, 1984), whose emphasis is in the company's internal factors - "the company can create competitive advantages from its resources, becoming more profitable" (BARNEY, 1986a, 1986b. 1991, 1997, 2001; PETERAF, 1993; KROGH and ROSS, 1995). RBV is a performance model focused on resources and capacities controlled by company as sources of competitive advantage which must be worthy, rare, difficult to copy and organized. The concept of essential competences from Hamel and Prahalad (1995) also caused great repercussion. In the 2000s, the fields and weapons of competition model - CAC was presented by Contador (2008), whose studies had started previously (CONTADOR, 1995a, 1995b). He matches two very distinct concepts which have been treated separately in specialized literature: the concept that company competitiveness comes predominantly

from its position in market, as Porter thinks (position represented by the fields of competition) and the concept that it comes basically from its internal factors, according to the adopted to RBV (factors called weapons of competition).

Since CAC is the most recent model, a study was conducted which aimed to evaluate efficacy, deficiencies and difficulties of the process of formulation of the competitive strategy prescribed by it, trying it in a high complexity company, as it is the hospital.

Besides the above-mentioned characteristics, CAC has others which in principle would give it advantages against other models: 1) separates the exterior view of company, represented by fields of competition, from the interior view, represented by weapons of competition; 2) explains all types of competitive advantage and all possible business competitive strategies; 3) it has a very strong thought which guides the formulation of competitive strategies and a clear criterion for the company to be more competitive, thought and criterion expressed in his thesis; 4) it is qualitative and quantitative - it has diverse mathematical variables which, matched to qualitative analyses, convincingly base its propositions; and 5) generates operational competitive strategies allied to business competitive strategy.

After those considerations, it can be affirmed that the scientific relevance and contribution of the study result from the pioneer application of process prescribed by CAC, to formulate the business competitive strategy and company operational competitive strategies. This article's contribution is on spreading, within academic and business environment, the way to employ that new process, which was able to formulate strategies for exceptional complexity company, like a hospital, and able to define which activities and resources the hospital needs to present with high performance to obtain competitive advantage in its segment. The originality and unprecedentedness of the article are attested since there is no similar study in literature.

### *1.2 Research methodology*

The questionnaires used for collecting the information required to the competitive strategy formulation, answered by six HNSL's directors, are described in the respective steps to the competitive strategy formulation process.

For studying the competitiveness in hospitals, it was used Popper's evidentiary deductive method (POPPER, 1968), according to which a proposition can only exist if properly formulated before being tried by experiment or systematical methods of observing, that derive from singular statements (in the case, the ones from CAC model). According to the usual taxonomy, the research was experimental, because aims to test by experiment an application of the process prescribed by CAC, and it is applied, because generates knowledge to a specific problem through a practical application.

After literature review shown in section 3, some concepts on CAC are exposed in section 4 and the process of the formulation of the competitive strategy in sections 5 and 6, simultaneously to its application to HNSL. The study background, usual in scientific articles, is shown in section 2. In section 7, dedicated to the study conclusions is also discussed and the process prescribed by CAC is compared to others.

## **2. THE STUDY ENVIRONMENT**

Brazil has 6,908 hospitals where 5,290 are general hospitals, 1,245 specialized hospitals and 373 hospitals-days. There are 262,101 clinical and surgical beds, where 62% are linked to SUS (Unique Health System) and 30.8% are non SUS (CNES 2010).

The hospital market is a complex market, and this complexity is not restricted to technology and processes. (PORTER and TEISBERG, 2007). For Bezanko *et al* (2006), the hospital services tend to be locally acquired, in order that each metropolitan area can be considered a distinct geographical market.

Besides the complexity, the hospital market is also extremely competitive, with tight result margins. Like other businesses, among other factors to formulate champion competitive strategies, it is imperious to clearly identify the effective clients which compound the hospital value chain, the interaction between them and the requirements, needs, preferences, or each type of client's expectations.

It is interesting to analyze the hospital segment under Porter's five forces theory (1979). Clients' power, in this case, the health plans operators, doctors and patients, is very big: operators has the power to qualify or disqualify any hospital, depending on its marketing or financial strategy, doctors has the power to send its surgeries to hospitals which have better technological or physical structure or those that which offer the best incentives; and patients can choose a hospital because of the specific preferences or geographical proximity. It is a segment

continuously threatened by substituting products: the *hospitals-day* (hospital for small surgeries with a not more than 24 hour internment period) competing with big hospitals and their surgery centers with immense structures; *home care* offering cheaper attendance; the specialized clinics (e.g. urology) competing with simpler structures; the telemedicine (medicine at a distance) replacing the need of great patients and doctors' displacements, propitiating convenience and threatening the existing specialized centers in some hospitals. These competitive strengths contribute for the low profitability of the segment, where few hospitals with good financial results are almost exclusively philanthropic that due to tax exemption, end up having competitive advantages almost unaffordable for private hospitals. Yet, the rivalry between the competitors is intense. Because of those reasons, according to Bezanko *et al.* (2006), in the USA, since mid-1980, about 75 hospitals went bankrupt and many struggle to being cleared.

In the specific case of Brazilian hospital segment, a series of problems make unable the attainment of satisfactory financial results by many hospitals: increasingly costs in all terms, especially drugs, inputs and services; the new technologies, mainly diagnoses, keeping costs under pressure and increasing services' demand; State influence, through its regulatory body, creating higher levels of requirements for health operators and consequently reducing trade margins; excessive bureaucracy; the high tax charge; etc.

Therefore, for being competitive in a so complex market, it is essential to make available a process that eases the formulation of winner strategies and a hospital to stand out from the competitors. The process here presented, based on CAC, has this capacity, because was successfully applied to the Hospital Nossa Senhora de Lourdes, since generated strategies which increased its competitiveness.

### 2.2 Hospital Nossa Senhora de Lourdes (HNSL)

The HNSL is one of ten companies of a familiar business group, founded for 50 years, which works in São Paulo city. Their gross incomes totalizes R\$ 114 million, 97% from diverse agreements, where 11% of the revenue is from the group itself. Only 3% of the revenue is from private clients. The Hospital does not offer the Unique Health System (SUS). It has 1,200 cooperators, amongst administrators, nurses and technicians, and invests 1% of the revenue on advertisement.

The financial strategy for the facilities physical expansion and update of the technological park is supported by the real estate funds, authorized by the CVM (Securities Commission). Basically, the operation consists of the sale of the building to a real estate fund, creating tradable shares on the primary market of Bovespa. Investors are entitled to a rent in exchange for the investment.

## 3. LITERATURE REVIEW

What is it and what are the sources of competitive advantage that have been object of study of numerous researchers over the past three decades. Competitive advantage can be defined as achieving solid results significantly higher than sector's average (BEZANKO *et al* 2006; VASCONCELOS and CYRINO 2000), or the capacity to generate more economical value than the competitor companies (BARNEY and HERSTERLY, 2007). Economic value can be defined as the difference between the benefits perceived and enjoyed by customers who purchase products or services of a company and the total economic cost of these products or services. Businesses that succeed in creating more value than competitors occupy a position of advantage over competitors in the market.

For Porter (1985), competitive advantage is the result of companies' capacity of doing activities which make them obtain lower costs than their competitors or better performance; originates in numerous distinct activities that a company does and that contributes for positioning company relative costs and creates a base for differentiation.

Ghemawat (1986) affirms that the difference between the questionable and the sustainable advantage is a matter of level. Sustainability is higher when based on diverse species of advantages or on a big advantage, and when there are few environmental threats.

For the main theorist on RBV (RUMELT, 1984; BARNEY, 1986a, 1986b, 1991, 1997, 2001; PETERAF, 1993; WERNERFELT, 1984; KROGH and ROSS, 1995), the source of competitive advantage of companies is on the set of competences and the resources controlled by it - "a company can create competitive advantages from its resources, becoming more profitable". For Penrose (1962), the company is a collection of resources and is exactly its capacity of internalizing the knowledge that propitiates the development and production of new products. RBV is based on two fundamental assumptions on resources and capacities controlled by company: resource heterogeneity and inaction.

For academics of dynamic capacities theory, like Prahalad and Hamel (1990; 1994) and Amit and Shoemaker (1993), the source of competitive advantage are the dynamic capacities: their management process (the way things are done in company), its assets of industrial and technological property, the available strategic alternatives (TEECE, PISANO and SHUEN, 1997) and the organizational routines and processes capable to regenerate the base of firms' resources (VASCONCELOS and CYRINO, 2000). Those capacities cannot be acquired in market - must be developed internally.

#### **4. THEORETICAL REFERENCE: Fields and weapons of competition model (CAC)**

In this section only the needed concepts to understanding the competitive strategy formulation process prescribed by CAC are exposed, and process description in the next one.

The concepts of fields and weapons of competition launched by Contador, in *USP Management Review* (CONTADOR, 1995a and 1995b) evolved due to researches conducted at organization of diverse economical segments. They were transformed into a very proper model, mainly to understand, analyze and explain how organizations compete, to propose measures assigned to enlarge competitiveness and formulate its business competitive strategy and operational competitive strategies, already aligned to business strategy.

##### *4.1 Concepts, definition and configuration of the competition fields*

Competition field is the imaginary *locus* of dispute between products or companies from client's preference within a market, where company seeks for reaching and keeping the competitive advantage, like product price and quality. That place is imaginary because only exists in people's mind, it is not real. The competition field is not more than an idea that guides the company competitive strategy formulation. The competition fields represent the attributes of product and company valued and of client's interest (CONTADOR, 2008, p. 18).

There are 14 competition fields, that is, there are 14 basic means (besides their innumerable combinations) of a company to distinguish - relative means to the product's characteristics and its own characteristics. The configuration of the competition fields consists of 14 fields aggregated in five macro fields (CONTADOR, 2008, P. 19):

- *Competition in price:* 1) in price itself; 2) in terms of payment; and 3) in prize and/or promotion;
- *Competition in product (goods or service):* 4) in product design; 5) in product quality; and 6) in diversity of products;
- *Competition in attendance:* 7) in access to attendance; 8) in attendance design; and 9) in attendance quality;
- *Competition in deadline:* 10) in deadline for product delivery; and 11) in deadline for attendance;
- *Competition in image:* 12) of product and brand; 13) of credible company; and 14) in social responsibility.

The competition fields show the possible business competitive strategies: the business competitive strategy formulation basically is consisted of product/market pair definition and the selection of competition fields for each product/market pair. Analogically, the competition fields represent the strategy of product positioning in market. Besides the competition field, there is another type: the support field. Competition field is that in which the company will effectively create or keep competitive advantage. In that, it will effectively compete by client's preference, creating the image of being better than the competitors from that field. Support field is that which complements the business competitive strategy of the company. It is an auxiliary field and not a competition field - in it, the company does not compete, but it contributes for reaching and keeping their competitive advantages (CONTADOR, 2008, p. 62).

##### *4.2 Concepts and definition of weapon and competition weapon*

Weapon is any activity performed or resource managed by a staff of the company with homogeneous assignments. Competition weapon is any activity performed or resource managed by a staff with homogeneous assignments used by company to conquer and/or keep competitive advantage.

There are dozens of weapons from a company. One same weapon serves to compete in more than one field, and competing in one field requires several weapons. The origin of the competitive advantage is in the competition weapons (but not only on them, as will be see further, when regarding competitiveness drivers). It is by means of their competition weapons that the company provides competitive effectiveness to their products for itself (CONTADOR, 2008, p. 21).



*The competition weapons show the operational competitive strategies of company.* This means that formulating the operational competitive strategies is to define the actions that the company must conduct on each weapon (CONTADOR, 2008, P. 21).

The weapons are classified by two criteria: 1) nature, production, attendance, design and support weapons (according to what was proposed by Contador, 2001); and 2) relevance for competition, relevant, partially relevant and irrelevant.

#### 4.3 CAC thesis and competitiveness drivers

CAC has a very strong central thought, that sustain all its conception: “*For the company to be competitive, there is no more relevant condition than having high performance only on those few weapons which bring it competitive advantage within the competition fields chosen for each product/market pair.*”

One of the strong points of CAC is to clearly specify where the company needs to have high performance. That thesis can express with a sentence the way to make the company competitive or more competitive. This proposition was stated as thesis exactly due to the need of being validated, highlighting the concern with the methodological strictness (CONTADOR, 2008, p.110).

By CAC, four are the competitiveness drivers: 1) product suitable to the assigned market; 2) adequate choice of competition fields and support fields for each product/market pair; 3) proper usage of competition weapons, what means identifying the relevant, partially relevant and irrelevant weapons for competition fields and support fields and defining their intensity; and 4) weapons alignment to competition fields and support fields (CONTADOR, 2008, P. 41).

#### 4.4 The qualitative sub-model

CAC uses seven quantitative variables, where two are primary, three are fundamental and two are tertiary. The two primary variables are those which depend on data obtained in company: weapon intensity and competitiveness level. The fundamental constitute the essence of the qualitative sub-model: average intensity of weapons, focus and dispersion. The tertiary, coming in third place due to depending upon the fundamental for being calculated, are: competitive use and power, variables necessary to the competitive strategy formulation process of company defined in subsection 5.9).

*Weapon intensity* is the intensity the company applies on weapon, ranked in five levels. It can be also defined as the weapon potency and range or the level of use efficacy of weapon resources. It is a discrete variable with 1-5 domain which must be assessed by the company according to described by the questionnaire. The 5 intensity level corresponds to the more evolved status of weapon, and the 1 intensity level, to the simpler status (CONTADOR, 2008, p. 114).

*Focus*, it the same as weapons’ focus within a competition field, assesses the application of efforts on weapons which provide competitive advantage within the field chosen for competition. In other words, this is the variable which measures the use of efforts on weapons relevant to the field chosen for competition or that assesses the use of weapons needed to business competition within the chosen field. Its value is calculated by the ratio between the sum of the intensity of the relevant weapons and the sum of the maximum intensity that can be obtained in such weapons. It is a continuous variable, with domain between 0 and 1 (CONTADOR, 2008, p. 117).

*Dispersion*, it is the same as dispersion of weapons within a competition field, it assesses the application of efforts on weapons which do not provide competitive advantage within the field chosen for competition. In other words, it is the variable which measures the application of efforts on irrelevant weapons on the chosen competition field or which assesses the use of weapons unusual to business competition within the competition field chosen by the company. It is the opposite to focus. Analogically to focus, its value is calculated by the ratio between the sum of the intensity of the irrelevant weapons and the sum of the maximum intensity that can be obtained in such weapons. It is also a continuous variable, with domain between 0 and 1 (CONTADOR, 2008, p. 117).

*Average intensity of weapons (IMA)* is the arithmetic mean of all weapons’ intensity (the relevant, the partially relevant and the irrelevant). It measures the level of intensity of those weapons’ set and is independent of the competition field chosen by the company. In other words, it measures the improvement efforts of all weapons and reflects the application of the philosophy of Total Quality. It is a continuous variable, with domain between 1 and 5 (CONTADOR, 2008, p. 118).

#### 4.5 Validation of the fields and weapons competition model

The CAC model was developed from 1991 to 2007 based on extensive research over the forms used by 471 Brazilian companies to compete. For validating the model, were conducted 12 quantitative researches in depth, involving 176 companies, from which nine were used to substantiate master dissertations and three to elaborate scientific researches projects. The epistemological validation of scientific strictness confers theoretical solidness to CAC, making their concepts reliable.

From the 12 researches' conclusions assigned to validate CAC, the following are interesting for this article (CONTADOR, 2008, p. 141 to 143):

- 1) the variable *focus* exerts great influence on company competitiveness, because explains, in the average of the 12 researches undertook at the companies, 79% of the phenomenon of competitiveness;
- 2) the variable *dispersion* does not influence the company competitiveness; and
- 3) the variable *average intensity of weapons* exerts moderate influence on company competitiveness, because explains in average, 44.8% of the competitiveness of the 176 companies.

Those results are used to validate CAC thesis: "*For the company to be competitive, there is no more relevant condition than have high performance only in those few weapons which give it competitive advantage within the competition fields chosen for each product/market pair*". This is because it is the focus that assesses the "*performance only on those few weapons which give it competitive advantage within the competition fields chosen for each product/market pair*".

Due to those reasons, the analyses and propositions based on CAC are mainly founded on the variable focus and, therefore, on the relevant weapons, as seen further.

### 5. IDENTIFYING THE COMPETITORS' COMPETITIVE POSITION

The identification of competitive companies' position is the essence of the analysis prescribed by CAC. In order to, there are eight required stages, yet direct to hospitals: 1) identification of product/market pair and of the clients and competitors i each product/market pair; 2) identification of the current fields of competition and support fields from the Hospital and competitors; 3) identification of the characteristics of product and company valued or of client's preference; 4) determination of set of weapons of competition typical from a child hospital; 5) classification of the weapons of competition, according to their relevance for competition within a settled field, as relevant, partially relevant and irrelevant weapons; 6) evaluation of weapons' intensity; 7) calculation of the variables average intensity of weapons, focus and dispersion; and 8) calculation of the variables use competitive use and power.

In order to ease the analysis of the current competitors' strategies and the new strategy proposition for HNSL, the hospitals' competitive position is summarized in the strategic map, shown in Table 3.

#### Stage 1 - Identification of product/market pair, clients and competitors

The market was only geographically segmented - south and central regions in São Paulo, without taking in account other criteria, e.g. revenue.

The study shaped HNSL's businesses, because identified the main products, the support field products (meals, hotel service and room service), the clients and the competitor hospitals. It was necessary to consider three kinds of clients: health plans operator, doctor and patient - since there are three kinds of clients, that need to be appropriately assisted and have conflicting interests, highlights the complexity of hospital business.

The competitor hospitals are situated on south and central regions in São Paulo. Competitor A: hospital situated on south region in São Paulo, with 265 beds; Competitor B: hospital with several sets in São Paulo city, which has one of the most reliable maternity homes in Brazil, counting with a Neonatal ITU and has about 300 beds; Competitor C: one of the reference maternity homes in São Paulo city, situated in the central region, which performs about 4,500 births per year; and Competitor D: one of the most traditional maternity home in São Paulo city, with 200 beds.

#### Stages 2 and 3 - Identification of the fields of competition and support fields of the hospitals and of the fields valued/preferred by clients

The stages 2 - identification of the fields of competition and support fields of the Hospital and competitors and 3 - identification of the product and company characteristics valued/preferred by clients (represented by the fields of competition) was done through a questionnaire which asked the indication of 4 of the 14 fields, in order of importance. This questionnaire was answered by six HNSL's directors.

Each assigned to the hospital for each competitor and for each type of customer, in his opinion, weight 4 for the most important competition field, weight 3 for the second, weight 2 for the third and weight 1 to the least important field. The highest score obtained by the sum of the weights corresponded to the first field and so on. The two fields most voted were considered as of competition, and the other two, as support fields. In total, nine fields were identified: Price, Terms of payment, Service quality, Access to service, Attendance design, Attendance quality, Attendance term, reliable image of company and Product and brand image. The results of these two steps are in the strategic map of Table 3.

CAC prescribes this identification because is by choosing different fields of competition and support fields that the companies are distinguished in terms of products' characteristics and/or company's itself.

#### **Stage 4 - Settlement of the set of weapons of competition typical of a child's hospital**

In this stage, 49 weapons of competition were identified, as shown in Table 1, obtained by the following procedure (prescribed by Contador, 2008, p. 79-90) from interviews with six HNSL's directors by the researcher: 1) selection, in the List of Weapons appearing in the Appendix of Contador's (2008), of all the activities and resources that have the potential to be weapons of the competition of the "child's hospital business" (named List of Weapons version 1); 2) validation and completion of this list by querying the diverse areas of HNSL using a questionnaire containing the description of the selected weapons and wondered if a generic maternity home uses them to compete, which resulted in the list of weapons version 2; 3) description of the contents of the weapons with the aid of HNSL areas; and 4) ID in the List of Weapons version 2, through content analysis, the weapons that have strategic characteristics necessary to be part of the named list of weapons of the competition typical of a child's hospital.

The questionnaire had two questions which must be answered affirmatively, so the weapon would be considered the competition's weapon: 1) that weapon is one of the most important activities of an administrative sector, one of the most frequently done and/or one of the most expensive in terms of people and equipment? and 2) that weapon is one of the most important resources of a section, it is one of the most frequently used and/or one of the most expensive?

#### **Stage 5 - Classification of the 49 weapons of competition in relevant, partially relevant and irrelevant weapons for each field of competition**

Not all weapons of competition are important for the company to compete within a field. Thus, the classification of the weapons in relevant, partially relevant and irrelevant weapons (CONTADOR, 2008, p. 91).

*Relevant weapon* is a weapon of the set of the company's weapons of competition which provide it high competitive advantage within a field chosen for competition and therefore, to compete, a weapon necessary for a competition within a given field. It is the high intensity of the relevant weapons that provides competitive advantage to company.

*Irrelevant weapon* is a weapon of the set of the company's weapons of competition that does not provide it competitive advantage within its field of competition or within the support field. That is, it is a weapon of competition useless for a given business competitive strategy and must have low intensity, requiring low investment.

*Partially relevant weapon* is a weapon of the set of the company's weapons of competition that provides it average competitive advantage within its field of competition. It is a weapon of intermediate importance among the relevant and irrelevant weapons for the field of competition and must have average intensity, being unjustifiable a high investment.

That classification was done by means of the matrix of weapons' prioritization and Nihans' Index, according to what is proposed by Contador (2008, p. 91-97). Nine matrices were elaborated, one for each field of competition identified in the stages 2 and 3. The above-mentioned influence of each kind of weapon on the company's competitiveness derives from the validation of the fields and weapons of competition model, exposed in subsection 5.8. Beyond the intensity of each of the 49 weapons, the Table 1 shows their relevance for each field of competition.

#### **Stage 6 - Evaluation of the current intensity of the 49 weapons of competition**

For each weapon's intensity evaluation, a questionnaire describing the 49 selected weapons of competition was elaborated, that was undertaken to several HNSL directors and managers, aiming to obtain a more homogeneous view on the intensity of each weapon of the hospitals and to reduce the level of subjectivity. For the evaluation, it



was adopted the prompt method: each respondent must identify, for each weapon, the child's hospital most developed in that weapon, assign intensity 5 to that weapon and evaluate the situation of the weapon of the other four hospitals within a scale ranging from 1 to 5. The value of each weapon's intensity, shown in Table 1, is the mean of the diverse individual evaluations.

**Stage 7 - Calculation of the variables average intensity of weapons, focus and dispersion**

In this study, the three fundamental CAC's variables were used: average intensity of weapons, focus and dispersion. Since those variables were defined in section 4.4, it is our purpose here to show how they are calculated.

Focus is the ratio between the sum of the intensity of the relevant weapons and the sum of the maximum intensity possible of being obtained in such weapons. Dispersion is the ratio between the sum of the intensity of the irrelevant weapons and the sum of the maximum intensity possible of being obtained in such weapons. The average intensity of weapons (IMA) is the arithmetic mean of the intensity of all weapons (the relevant, the partially relevant and the irrelevant).

In order to make calculation easier, Contador (2008, p. 117) recommends the use of an Excel worksheet. 45 worksheets were processed, one for each of the five hospitals within each of the nine fields. The results are in the strategic map in Table 3.

**Stage 8 - Calculation of the variables *competitive use and power***

Company's 'competitive power within a subset of fields is the mean of 'focus' value of each field of competition and of each support field which shapes that subset of fields (CONTADOR, 2008, p. 123). In the case of HNSL, e.g., the competitive power (0.863) is the mean of the foci of the fields marked with an asterisk (see Table 3, section 6.2).

Company's 'maximum competitive power is the mean of the highest focus' values. This highlights the set of the fields in which the company has major strength (see Table 3).

*5.1 Analysis of the hospitals' competitive positioning*

The analysis of the fields of competition and support fields of each hospital enables the identification of its business competitive strategy, because, by CAC, it is basically represented by the product/market pair and by the fields of competition and support fields for each pair. The analysis of the values of the average intensity of the weapons, focus and dispersion of each hospital in the diverse sets of fields enables the identification of the operational competitive strategy, because, by CAC, it is basically represented by weapons' intensity that reflects the actions the company conducted on each weapon's activities and resources (CONTADOR, 2008, p. 21).

Consequently, the analyses of the fields and values of the diverse mathematical variables of CAC permit the appearance of new competitive strategies for HNSL. Table 3 - Strategic Map - shows the values of weapon's focus of the five hospitals in all the nine fields regarded in the study and indicates the fields valued or preferred by the three types of clients. It is important to note that health plan operator, doctor and patient have distinct needs and perceptions, which are highlighted by the value each one gives to each field of competition and support field (always according to HNSL's directors' perception which answered the questionnaire). For doctors and patients, there are three common fields: service quality, access to attendance and company image. The only difference is that the doctors place greater value on attendance design that patients that place value on attendance quality. For the health plan operators, price is priority, because the main component of their result statement is the attendance costs that represent more than 70% of their total expenses. Therefore the field they value the most is the price, but they also place value on access and term of attendance, putting terms of payments at fourth place.

1) Table 2 - Competitive power according to clients' view - it permits several conclusions:

1) The competitor C is the most powerful hospital, because it owns major competitive power in the four sets of fields: in which decided to compete (0.930), in the valued by the operators (0.902), by the doctors (0.928) and by the patients (0.931), that is, it is the best positioned to attend the three types of clients. On second place, there is the competitor B, third D and fourth HNSL. The competition field A is by far the less powerful, because its foci's values in the diverse fields are very low.

2) The four fields chosen by the competitors B, C and D and three of the chosen by HNSL are valued by patient, though not in the same order. Due to that strategy, those four hospitals implemented measures that increased the intensity of the relevant weapons and, so, highly focus on those fields, what is highlighted by the values of the competitive power, mainly the competitors B and C.

- 3) Three of the four fields chosen by the competitors B, C and D and two of the chosen by HNSL are valued by doctor, though not in the same order. Note that those hospitals have higher values of competitive power in those fields.
- 4) The four fields of competition A are perfect aligned to the valued by operator, but the intensity of their relevant weapons for those fields is very low, what results in low focus' values - its competitive power is 0.388 in that set of fields.
- 5) HNSL has a good competitive power in the fields valued by doctor (0.853) and patient (0.865), but not so high in the fields valued by operator (0.752). Regarding the analysis of the maximum competitive power (see Table 3), if HNSL chose to compete in the fields they have higher focus, its competitive power would change from 0.865 to 0.925.
- 6) In short, HNSL and competitors B, C and D are more prepared to support doctors and patients, than the interests of the health plan operator. The opposite occurs with competitor A.

It is interesting to compare the values of the competitive power and the average intensity of weapons, that, divided by 5 (maximum intensity value of weapon), stay in the same domain (between 0-1). The presence of all those values lower than those from the competitive power, in the five hospitals, highlights that the hospitals invest more in relevant weapons for the several sets of fields. That is, they notice that investing in irrelevant weapons does not increase their competitive advantage. It is an intuitive and not so cleared perception, but defending the same as CAC.

## 6. DECISION ON COMPETITIVE STRATEGY

The analysis of the hospital segment concluded that the presence of the three distinct clients (operators, doctors and patients) hinders the choice of one of two common fields of competition which meet those clients' needs. Whereas the health plans operators primarily chooses price, the doctors chose service quality and the patients want a reliable image of company (see Table 3).

This means that a hospital must firstly decide about the client that wants to preferentially attend. That because there is a mismatch between some fields of competition: if chose competition in price, e.g., it will not get to compete in service quality (whose concept is to aim having the best service quality among the competitors) that, at maximum, can be a support field of price field.

Secondly, it must analyze its own competitive position and its competitors' - which are the fields of competition and support fields, the strengths and weaknesses measured by the variable focus in each field and its use in each field - and chose its fields (competition and support fields). The strategic map shown on Table 3 (subsection 6.2) summarizes that information.

Thirdly, the hospital must define the operational competitive strategies. According to CAC, that definition is very simple. The research conducted by Contador (2008, p. 141) to validate CAC concluded that the focus explains, in the average of the 176 companies which took part of 12 researches, 79% of the phenomenon of competitiveness. That means that the higher the focus, the more competitive is the company. Therefore, in order to increase the level of the company's competitiveness, it is necessary to increase the focus of the weapons within the fields chosen for competition, that is, to increase the relevant weapons for those fields. Since, in the process of strategy analysis, those weapons have been already identified and had their intensity assessed, the hospital knows what to do increase the intensity of the relevant weapons.

### 6.1 *Business competitive strategy - decision on the fields of competition*

He selection of the new fields by HNSL was determined after analyzing the guidelines suggested by Contador (2008, p. 385): 1) chose fields of competition and support fields at the same level as those valued by clients; 2) chose fields according to foci's descending order; 3) compare itself with competitors, regarding the fields into which the product competes, to vulnerabilities, the competitive urge and the competitive position and decide if contests or wriggles from the competition; 4) chose fields in the descending order of use; 5) seek for not electing incompatible fields; 6) decide on the use or intensification of support field products; 7) take in account the level of competitors' level of satisfaction with their competitive position; 8) take in account the level or turbulence for business environment; 9) assess how the strategic alternatives affect and are affected by industrial structure; and 10) verify is the business competitive strategy will meet the most influential shareholders and stakeholders' expectations.

On the basis of the strategic map shown in Table 3 and above-mentioned guidelines, the following fields were selected due to the reasons briefly exposed below.

1° Field of competition - Service quality. Field valued by doctor and patient second place (guideline 1) and that presents the lower dispersion and best use (guideline 4). In it, three competitors seek for obtaining competitive advantage, but HNSL is strong, because the focus of 0.89 is relatively high (guideline 2), and it has conditions to increase the intensity of some relevant weapons so that it can face them (guideline 3).

2° Field of competition - Access to Attendance. Field valued by the three types of clients in second and third place (guideline 1), in which HNSL is strong, because the focus is 0.90 (guideline 2). In it, the four competition fields seek for obtaining competitive advantage, but HNSL is powerful to face them, because its focus is lower than the competition's only (guideline 3).

3° Support field - Attendance quality. Field in which there are the best HNSL's weapons, because its focus of 0.97 is so high (guideline 2), and, even though valued only in fourth place by patient (guideline 1), in that HNSL is powerful to face the three stronger competitors, that seek for obtaining competitive advantage within that field (guideline 3).

4° Support field - Image of reliable Company. Field valued, firstly by patient and thirdly by doctor (guideline 1) and chosen as field of competition by the two strongest competitors and as support field by the third competitor. (guideline 3). Notwithstanding HNSL is weak (focus 0.69), it cannot let competitors free to meet patient and doctor's interests. This strategy will require investments to increase the intensity of the relevant weapons for field.

It can be noted that the proposed competitive strategy slightly differs from the current. The competition in Service Quality was kept, and the fields Attendance Quality and Image of reliable Company slightly lost importance. The news was the election of Access to Attendance as the second field of competition. That shows the accuracy of the current strategy - for no other reason that, in the first quarter of 2009, revenues grew by more than 40% over the same period of the previous year. The other fields were not selected due to the following reasons:

1ª) The fields *Price and Terms of Payment* were not selected because are valued only by operator (guideline 1), because HNSL is not prepared to take action on them, what is highlighted by the low focus' value within those fields, respectively 0.71 and 0.50 (guideline 2) and because those fields are incompatible with the chosen ones (guidelines 5).

2ª) The field *Attendance Design* was not chosen because is valued only by doctor (guideline 1), for not being chosen by any competitor (guideline 3) and due to the fact that HNSL has already a high focus (guideline 2), so new investments are unnecessary.

3ª) The field *Deadline of Attendance* was not selected because is valued only by operator (guideline 1), in which only competitor A, which has the lower competitive power, seeks for obtaining competitive advantage (guideline 3) and due to the fact that HNSL has already a high focus (guideline 2).

4ª) The field *Product and Brand Image* appeals nor to clients, or competitors.

Analyzing the fields selected under the view of Porter's five strengths (guideline 9), it can be concluded that these fields: 1°) are a strong initial barrier for new competitors, mainly small maternity homes, letting HNSL practically "alone" to attend the south region of São Paulo, Grande ABC (industrial region) and Baixada Santista (harbor and beaches); 2°) recognize and meet doctor and patient's interests and give strength to HNSL to counteract to the pressure for low price form operator, since it will increase the quality of service and attendance and provide respectable image; 3°) seek for inhibiting the threat of replacement product, represented by small clinics that do not count with the most complete structure of a hospital such as ICU and medical diagnostic laboratories; and 4°) guide HNSL to improve its competences to face competitors' rivalry.

The new business competitive strategy meets the shareholders' expectations (guideline 10), because HNSL will start acting within fields well valued by doctor and patient and will have power to constrain the operator for higher prices, what will increase its profit margin. And meets the most influential stakeholders' expectations, like medical body, nursing body and workers who will necessarily need to be more trained, what will reflect in remuneration.

#### 6.2 *Operational competitive strategy - definition of weapons' intensity*

Business competitive strategy established, the next step is to define the operational competitive strategies, what, by CAC, is very simple: it only takes to increase the focus of weapons within the chosen fields, that is, increase the intensity of relevant weapons for those fields, weapons that have already been identified and had their intensity assessed.

According shown in Table 4, HNSL can increase its focus in the fields Service Quality and Access to Attendance to 0.93 and 0.96, by only investing in weapons 1 and 12, so that their intensity grows. Since HNSL appears strategically fragile in field Image of reliable Company, in order to increase the focus from 0.69 to 0.80, it is necessary to invest to have weapons 24, 37, 39 and 42's intensity increased.

In that way, HNSL's competitive power will go to 0.915, surpassing the competitors A (0.388) and D (0.866) and being closer to the competitors B (0.923) and C (0.931), as shown in Table 3.

Finally, it must be recorded that the proposed competitive strategy was accepted by the Directory Board of Hospital Nossa Senhora de Lourdes, because they were convinced of their capacity to increase Hospital's competitiveness.

## 7. CONCLUSIONS

This article reported the study conducted which aimed to test the new competitive strategy and competitiveness enlargement prescribed by the fields and weapons of competition model (CAC), process which was used to investigate the factors that determine the competitiveness of five important hospitals in São Paulo city and to formulate the Hospital Nossa Senhora de Lourdes' competitive strategy.

That process aims to formulate competitive strategies (business and operational) that propitiate competitive advantage to company regarding their competitors and increase its level of competitiveness.

Through CAC, the business competitive strategy is essentially represented by product/market pair and its fields of competition and support fields, and the operational competitive strategy, by the weapons of competition and the weapons' intensity.

The process application led to the need of considering three distinct types of clients (health plan operator, doctor and patient), that need to be properly attended and have conflicting interests, what makes the process of hospital's competitive strategy formulation very complex.

CAC, which is at the same time analogical and symbolic, and qualitative and quantitative, generated a process capable to propose strategies that were accepted by HNSL's Directory Board, because showed capacity to increase Hospital's competitiveness. Those strategies came from the understanding on segment competition, competitive positioning and alignment of the operational competitive strategies to the business competitive strategies. The quantitative pillar of the process is founded in CAC's variables: weapon's intensity, focus, dispersion, competitive use and power.

CAC's deficiency is on its incapacity to formulate the corporate strategy, yet recognized by Contador (2008, p. 34). Since CAC is an analogical model, it does not have a *constructo* analogical to the corporate strategy as it has regarding to the business competitive strategy, represented by the fields of competition of each product/market pair, and to the operational strategy, represented by the weapons of competition and their intensities.

The difficulty of applying the process is on the need to describe the weapons' content and intensity, because requires knowledge in its arts status, and in the elaboration of the matrix of the prioritization of weapons for each field of competition, which is very tough.

Notwithstanding, the process was tested at a hospital, the exposed here is applied to the formulation of any company strategy inserted within a competitive environment.

The scientific relevance and contribution of study result from the pioneer application of the innovative process prescribed by CAC to qualitative and quantitatively formulate a competitive strategy of a company. And this article contribution is to spread, in the academic and business environment, the way to apply that new formulation of business and operational strategies, that was capable to formulate strategies for a very complex company, like a hospital, and to define the activities and resources in which the hospital needs to have high performance to obtain competitive advantage in its segment. The originality and unprecedentedness of the article are attested since there is no similar study in literature.

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**Table 1 – Intensity of weapons of each hospital and weapons’ relevance of each competition field**

Nº	Weapons of competition	Weapon’s intensity					Weapon’s relevance								
		H	C	A	D	B	QS	QA	IP	IE	PA	AA	PR	CP	P
1	Easy access	3	4	2	4	5	R	S	S	S	S	R	S	I	I
2	Strategic controller	3	5	1	5	5	S	S	I	R	S	I	I	R	R
3	Primary attendance	5	4	3	4	4	R	R	R	R	R	R	R	S	S
4	Physical environment for attendance area	5	5	2	4	5	R	R	R	S	R	S	R	I	I
5	Complementary services	5	4	2	4	4	R	R	R	S	R	R	S	I	I
6	Rooms’ infrastructure	5	5	2	4	5	R	R	R	S	R	R	R	I	I
7	Infirmaries’ structure	5	5	2	4	5	R	R	R	S	R	R	R	I	I
8	Pharmacy’s infrastructure (materials)	5	5	4	5	5	R	R	S	S	R	S	S	S	S
9	External benchmarking	3	4	2	4	4	S	S	I	R	S	I	S	I	I
10	Attendance sameness	5	3	5	5	5	S	R	R	S	R	R	R	I	I
11	Technology of the “care”	5	5	2	5	5	R	R	R	S	R	R	R	S	R
12	Medical staff	3	5	2	4	5	R	S	R	S	S	R	R	S	S
13	Level of equipment update	4	5	1	4	5	R	S	R	S	R	S	R	S	R
14	Credit management	3	4	2	4	4	I	I	I	I	S	I	S	R	S
15	Financial management	3	4	2	4	4	I	I	I	I	S	I	S	R	R
16	Clients’ satisfaction monitoring	5	5	2	5	5	R	R	R	R	S	R	S	I	I
17	Attendance protocols	5	5	5	5	5	R	R	R	S	R	S	R	I	I
18	Levels of services	4	5	4	4	5	R	R	R	S	R	R	R	I	I
19	Definition of the productive capacity	3	5	2	5	5	R	S	S	S	R	I	R	R	R
20	Management software	3	5	2	5	5	S	S	S	I	S	I	S	I	I
21	Electronics Record	5	5	0	5	5	R	R	R	S	R	S	R	S	R
22	Business management	3	4	2	4	4	I	I	I	I	S	I	S	S	S
23	Business staff	3	4	2	4	4	I	I	I	I	S	I	S	S	S
24	Customer relationship management	3	4	1	4	4	I	S	S	R	I	S	S	R	I
25	Accreditation level (Certification per institute)	5	5	1	5	5	R	R	R	R	R	S	S	I	I
26	Hotel keeping	4	5	1	4	5	R	R	S	S	R	S	S	S	S
27	System of hospital indicators	5	5	2	5	5	S	R	I	S	I	S	I	S	R
28	Suppliers’ relationship management	3	5	1	5	5	S	S	S	R	I	S	S	R	R
29	Shareholders’ capacity of investing	1	4	1	5	5	I	I	S	I	I	S	S	R	S
30	Formulation of competitive strategies	4	4	2	4	4	I	I	S	I	S	S	S	S	S
31	Analysis of competition	2	4	1	4	4	I	I	I	I	I	S	I	R	R
32	High management leadership	3	4	2	4	4	S	S	I	S	S	S	S	S	S
33	System of competitive intelligence	2	5	1	5	5	S	S	S	S	I	S	I	S	S
34	Balanced Scorecard	4	4	0	4	4	S	I	I	S	I	S	I	S	S
35	Advertising and Propaganda	2	5	0	2	3	I	I	R	S	I	I	I	I	I
36	Market research	2	5	0	2	3	I	I	I	I	I	I	I	I	I
37	System of personnel’s evaluation	3	4	1	4	4	I	S	I	R	I	S	I	S	S
38	Recruitment and selection	3	4	2	4	4	I	S	S	I	I	S	I	I	I
39	Wage and rewards policy	2	5	0	5	5	S	S	S	R	S	S	I	S	S
40	Staff training	4	4	1	4	4	S	S	S	I	R	S	R	S	R
41	Wage position regarding market	2	4	1	4	5	S	I	S	I	I	I	S	S	S
42	Organizational structure	2	3	1	3	3	I	I	S	R	S	I	I	S	R
43	System of decision-making	3	4	2	4	3	I	I	S	I	S	I	I	I	I
44	Organizational culture (familiar)	3	4	1	3	3	I	I	I	R	S	I	I	S	S
45	Electronic Purchase	3	5	1	5	5	S	S	I	R	S	S	S	R	R
46	System of costs and budget	3	3	0	3	3	I	I	I	I	I	I	I	S	R
47	Social marketing	3	4	0	4	4	S	S	S	R	I	I	I	I	I
48	Advanced financial strategies	5	5	0	2	2	S	I	I	R	I	S	I	R	R
49	External counsel	4	4	0	3	3	S	I	R	R	I	I	I	I	I

Legend: H = Hospital Nossa Senhora de Lourdes; A = competitor A; B = competitor B; C = competitor C; D = competitor D.

Legend of the fields of competition: QS = service quality; QA = attendance quality; IP = product and brand image; IE = image of reliable company; PA = attendance design; AA = access to attendance; PR = attendance deadline; CP = terms of payment; P = price.

Weapon’s relevance: R = relevant weapon; S = partially relevant weapon; I = irrelevant weapon.

Source: Authors

**Table 2 – Competitive power under clients' view**

<b>Competitive power</b>	<b>HNSL</b>	<b>Comp. A</b>	<b>Comp. B</b>	<b>Comp. C</b>	<b>Comp. D</b>
Under health plan operator's view	0,752	0,388	0,885	0,902	0,875
Under doctor's view	0,853	0,404	0,921	0,928	0,861
Under patient's view	0,865	0,412	0,923	0,931	0,866
In the fields chosen for competition	0,863	0,388	0,923	0,930	0,865
<b>Average intensity of weapons</b>					
Average intensity of weapons (IMA)	3,53	1,55	4,33	4,43	4,12
1/5 of the average intensity of weapons (IMA)	0,706	0,310	0,866	0,886	0,824

Source: Authors

**Table 3 – Strategic map for the formulation of the new competitive strategy of the HNSL**

Fields of competition		Price	Terms of payment	Service quality	Access to attendance	Attendance design	Attendance quality	Attendance deadline	Image of reliable company	Image of product and brand	Competitive power
d	by health plan operator	1°	4°		2°			3°			
	by doctor			1°	2°	4°			3°		
	by patient			2°	3°		4°		1°		
nt fields of	competitor A	1°	4°		2°			3°			
	competitor B			2°	4°		3°		1°		
	competitor C			2°	4°		3°		1°		
	competitor D			1°	2°		3°		4°		
	HNSL			1°			2°		3°	4°	

Variables											
etitor A	Current focus	0.21	0.34	0.44	0.52	0.46	0.49	0.48	0.20	0.41	
	Current competitive power	*	*		*	*	*	*			0.388
	Maximum competitive power				*	*	*	*			0.488
etitor B	Current focus	0.90	0.80	0.96	0.90	0.94	0.95	0.94	0.88	0.94	
	Current competitive power			*	*	*	*	*	*		0.923
	Maximum competitive power			*	*	*	*	*	*		0.948
etitor C	Current focus	0.86	0.82	0.98	0.96	0.96	0.97	0.97	0.81	0.93	
	Current competitive power			*	*	*	*	*	*		0.930
	Maximum competitive power			*	*	*	*	*	*		0.970
etitor D	Current focus	0.84	0.92	0.88	0.86	0.89	0.91	0.88	0.81	0.84	
	Current competitive power			*	*	*	*	*	*		0.865
	Maximum competitive power		*	*	*	*	*	*	*		0.900
r	Current dispersion	0.71	0.50	0.89	0.90	0.93	0.97	0.89	0.69	0.90	
	Use	0.52	0.74	0.39	0.52	0.59	0.58	0.60	0.56	0.69	
	Sector's focus	0.19	-0.24	0.50	0.38	0.34	0.39	0.29	0.13	0.21	
	Current competitive power	7	9	5	3	2	1	6	8	4	
	Maximum competitive power			*	*	*	*	*	*	*	0.863
	Current maximum power X				*	*	*	*	*	*	0.925
											-7%

HNSL's strategy decision											
of competition and support proposed				1°	2°		3°		4°		
and competitive power proposed				0.93	0.96		0.97		0.80		0.915
dispersion				0.46	0.54		0.58		0.56		
				0.47	0.42		0.39		0.24		

Source: Authors

**Table 4 – Proposal of operational competitive strategy for the HNSL**

N°	Weapon of competition	Field Service Quality		Field Access to Attendance		Field Image of Reliable Company	
		Weapon's Intensity		Weapon's Intensity		Weapon's Intensity	
		Current	Proposed	Current	Proposed	Current	Proposed
1	Ease to access	3	5	3	5		
12	Medical staff	3	4	3	5		
24	Client's relationship management					3	5
37	Personnel's evaluation system					3	5
39	Wage and rewards policy					2	4
42	Organizational structure					2	4
Variable		Current	Proposed	Current	Proposed	Current	Proposed
Sum of the relevant weapons' intensity		76	79	45	48	52	60
Quantity of relevant weapons		17	17	10	10	15	15
Focus		0.89	0.93	0.90	0.96	0.69	0.80
Sum of the irrelevant weapons' intensity		31	37	44	46	42	42
Quantity of irrelevant weapons		16	16	17	17	15	15
Dispersion		0.39	0.46	0.52	0.54	0.56	0.56

Source: Authors