

## **STRATEGIC MANAGEMENT STUDY BASED ON BUCKELY'S FUZZY-AHP AND SWOT: EXAMPLE OF THE CONGREGATION OF THE MISSIONARIES OF THE SACRED HEART**

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### **ABSTRACT**

Strategic priorities are commonly implemented by both profit and non-profit institutions, but rarely employed by religious congregations. The congregation of the Missionaries of the Sacred Heart (MSC), an institution in the Catholic Church, has undertaken an empirical study, using a combination of SWOT and fuzzy-Analytic Hierarchy Process (AHP) methodologies. Four strategies were employed. First, the strategy S-O (30.1%), aimed at intensifying and improving our human resources in order to enrich the lives of all our members. Second, we adopted the strategy S-T (25.8%) that focused on our

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Sacred Heart Spirituality to empower the fraternal community. Third, we adopted the strategy W-T (24.1%) that aimed at strengthening the Sacred Heart Spirituality throughout the entire MSC family. Finally, we used the strategy W-O (20.1%) in order to strengthen networking in the congregation while also revitalizing family ministry. A sensitivity analysis confirmed the SO alternative as the main strategy. Internally, the congregation is quite strong but more needs to be done to deepen the Sacred Heart Spirituality among all our members. The researchers recommend conducting further study of the congregation about how they perceive the MSC pastoral ministry and understand the vision.

Keywords: SWOT- fuzzy AHP; MSC; strategic management; Catholic, decision making; religious

## **1. Introduction**

The word 'strategy' or strategic planning, which is commonly used in management, organization and business, is defined as the art of creating specific business and management strategies, and implementation and evaluation of the achievements. The application of strategic planning and the achievement of goals always integrate the involvement of all units in the organization. The focus is on the results or outcomes, rather than products or outputs (Candy & Gordon, 2011). Gyampoh and Asare (2019) added that a strategy is a unified, comprehensive and integrated plan that relates the strategic advantages of the firm to the challenges of the environment. It is designed to ensure that the basic objectives of the enterprise are achieved through proper execution by the organization.

The benefits of strategic planning are as follows: helps formulate the goals and objectives of organization, helps identify strategic issues and the main priorities of the organization, helps allocate the distribution of resources, assists human resource development, and assists leaders in making correct decisions. Strategic planning will drive the efficiency and effectiveness of the work of an organization's management. Thus, strategic planning is an indicator of effective management and at the same time the strength of organizational leadership.

The church as an organization that serves the community must understand the context of its ministry, namely the local people. An important question that must be answered is what are the important issues for the Missionaries of the Sacred Heart congregation (MSC) now? This is where the importance of context and strategic management are seen. (Oosthuizen & Lategan, 2016).

The MSC as a religious organization within the Catholic Church cannot be separated from the implementation of strategic management. Although MSC is not a business institution, the application of management principles in the organization is important (Gyampoh & Asare, 2019). As an organization with universal values, MSC needs a management system that provides a guide to assist in the execution of its mission according to the context of the times and culture.

The MSC, which was founded in 1854 in Issoudun, France by Jules Chevalier, is an international religious congregation of priests and brothers, serving the Catholic Church in 48 countries. In Indonesia, the congregation is growing. The religious vocation is increasing, training centers have been established, and services have expanded, not only in parishes but also abroad. Support from the laity, especially the lay MSC members, gives hope for the MSC to move forward into a new future. The organizational structure and its administration are essentially no different from other congregations in the Catholic Church. Elements such as leadership position and councils, vision and mission, and spiritual values as well as governance and norm systems are fundamental components of every religious congregation.

The congregation also faces a number of challenges. Extensive media coverage of the sexual abuse crisis in the Catholic Church has tarnished the image of the Church and damaged the reputation of the priesthood. For young people, the pleasures, enjoyments, and allurements offered by the modern world have diminished a sense of calling to both the priesthood and religious life. Internally, MSC Indonesia faces leadership and management challenges. Leadership that relies on authority and position are no longer viewed as acceptable. Efficient leadership that is in tune with the needs of the community while maintaining its core values is required.

As a social and organizational entity, the MSC is called to adopt modern methods of strategic planning to manage their assets and people, to contextualize their spirituality and mission, to introduce innovation in their pastoral services, and to strengthen their internal environment (Miller, 2002). Just as all organizations, the institution has stakeholders, intended and emergent strategies, structures, and processes. They are open systems depending on external resources (Miller & Kent, 2016). The MSC must determine which strategic priorities the congregation should apply to achieve their vision and meet their goals.

The importance of implementing strategic management in church organizations such as MSC is apparent, but the literature on this topic is very rare or even absent. This study will contribute to developing the congregation's future initiatives and at the same time address the lack of literature on this topic. In this study, the researchers aim to establish the most appropriate strategic priorities for the MSC congregation in its service of ministry for the new millennium. The researchers plan to do this by developing an effective Analytic Hierarchy Process (AHP), combining fuzzy-AHP and SWOT to develop an integrated process, with a clearer and a more effective set of priorities for ministry today.

This study uses a combination of the SWOT and fuzzy-AHP methods. The researchers believe that a combination of these two methods is very powerful for the kind of strategic planning we are pursuing. Thus far, the relevant literature indicates that no religious congregation has used this combination of SWOT and fuzzy-AHP. This is a pioneering strategic study of a Catholic institution, in this case the MSC congregation. Although this research is a case study of the MSC congregation, the results of this research will undoubtedly be useful as a model for any religious organization with similar characteristics. Even organizations outside the Catholic Church can draw inspiration from the results of this research for the implementation of its vision and mission.

This study is organized into seven sections. The first part of the study discusses the background, problems and objectives of the study. The second part is the literature review which includes an overview of previous studies. The third part investigates the methodology of SWOT and Buckley's fuzzy-AHP and their combination. The fourth part of the research discusses the results of the study which includes consistency tests, results of analysis of criteria, sub-criteria, alternatives, and global values. Global value is the multiplication of the results of the criteria, sub-criteria and alternative strategies. The fifth part is the sensitivity analysis. The sixth part of the research discusses the results of the analysis. The seventh part highlights the conclusions and recommendations.

## **2. Literature review**

### **2.1. The Missionary of the Sacred Heart (MSC)**

Like other church institutions, the MSC has members, structures, and rules, and is involved in the management of properties. This congregation is a social entity, non-profit in nature, and strategic planning techniques will provide a more effective and efficient plan to accomplish the ministry of pastoral work for human salvation (Ohoitumur, Krejci, Raco, Raton, & Taroreh, 2019).

The MSC congregation is an international group of priests and brothers in the Catholic Church, and the number of its members is growing. The congregation owns training centers and properties. Their members are working as parish priests both in the country and abroad, some are acting as professionals mostly in educational institutions as lecturers or teachers. The institution manages assets and runs small businesses. The members practice a participatory style of leadership, supported by a strong fraternal community from within and by MSC lay communities (Kwakman, 2011).

The church, as a service industry needs to have people with competence, credibility, reliability, responsiveness, trust, security, and an understanding of their customers (Santos & Mathews, 2001). Excellent hospitality is demanded from church personnel such as MSC members. They should be acting like good Samaritans, giving hope and compassion, especially to the poor and destitute (Dries, 2015). This is in line with the charism of the MSC, namely special care for all people, especially the poor, the oppressed, the marginalized, through charity, gentleness, compassion and kindness.

The essence of the MSC charism is the belief that an act of love (*agape*) can change a human life. In light of that charism, the members live the spirituality of the heart as a way of life. The concrete manifestations of this charisma and spirituality can be seen in various aspects of MSC's mission, such as special care for all people, especially the poor, the oppressed, the marginalized, through charity, gentleness, compassion and kindness (Cuskelly, 1978). Initially, this charism was a response to the prevailing social ills of the time in 19<sup>th</sup> century France, namely, egoism and religious indifference (Nguyen, 2014). Jules Chevalier, the founder of the MSC congregation, advocated that all who are miserable must be touched and supported with a compassionate heart. According to Chevalier, first of all, compassion must be lived by members of the congregation as a core part of spiritual identity establishing a religious brotherhood (Kwakman, 2011).

It is realized that religious identity and all the fundamental values contained in charisma, mission, and spirituality are dynamically related to one's life. This means that religious identity, community life, ways of carrying out missions, and other forms of spirituality are always changing and require renewal. The MSC congregation constantly faces aspects of renewal in religious life (Cuskelly, 1978). These aspects include authority and leadership, community life and work, rules, and identity. In this context, strategic planning and management becomes an essential element in the future success of the MSC congregation.

One of the major challenges facing the Church today, including the MSC congregation, is the issue of clerical sex abuse, which has tarnished the good image of the church and its priesthood. It has caused extensive and profound trauma to the victims who are mostly children, often altar boys (Warner, 2019). Victims often feel hopeless, losing positive vision for their future, losing inner peace, and feeling no meaning in life. They encounter ethical upheaval and a disturbed relationship with God (Demasure, 2016). The honor, respect, and trust they held for the priest, as God's representative in the world, has been seriously damaged (Warner, 2019). Church personnel, particularly priests, are now considered a dangerous threat for the victims. As a result, faith in the Church has declined significantly (Donnelly, 2015). Often the target of public mockery, the Church, as an institution, is no longer trusted. (Vela-McConnell, 2018).

The priests also experience many problems. Priests are expected to have a lifetime commitment to the Church through their service, loyalty, trust, and obedience to their superiors. They are required to live a holy life and prioritize common interests (community) rather than personal ambitions. Many priests feel under pressure, exhibiting frustration and boredom. Some priests feel a lack of support, from both fellow priests and superiors, thus affecting their motivation, mental health, and ultimately the quality of their work (McDevitt, 2010). Priests can also be discouraged by the fact that young people today, lured by the distractions of the modern world, no longer show interest in the Church or priesthood (Stark & Finke, 2000). In addition, a growing number of people are leaving the Church and no longer believing in God (Brown, 2014).

Against this complex background, the MSC in the region of Sulawesi, now wish to look deeper into both their internal and external circumstances cited from the Constitutions and Statutes of the Missionaries of the Sacred Heart of Jesus (Braun, 2000) and develop strategies to move forward in their ministry. Braun mentioned several important aspects, namely the inspiration of spirituality of the heart, participatory leadership, member development and coaching, asset management, regional mission services, and the participation of the MSC lay people-professed.

## **2.2. Strategic management in the Church**

There are three factors that highlight the importance of implementing strategic management in church organizations, including MSC. First, the leadership has a commitment to develop suitable content and focus on proper use of resources. Second, church organizations are tasked with serving a diverse group of people, and church ministers must have multiple strengths and weaknesses because they need to master the right strategy in ministry. Third, achieving the vision and mission requires coordination

of all levels of the organization. All of these activities are at the heart of sound management (Chatira & Mwenje, 2018).

According to Shah and David, the application of strategic management in church organizations has biblical basis (Shah & David, 2004) such as:

“Where there is no vision, the people will perish...” (Proverbs 29:18)

” Without counsel, plans go awry, but in the multitude of counselors, they are established”. (Proverbs 15:22)

“Listen to counsel and receive instruction, that you may be wise in your latter days” (Proverbs 19:20)

“Plans are established by counsel: by wise counsel wage war”. (Proverbs 20:18).

The Church, as a social entity and a non-profit organization, must start considering strategic planning techniques in the planning of pastoral services. By utilizing strategic planning methodologies, the Church's programs will become more efficient by having specific, focused targets and goals that can be measured, evaluated and improved over the years (Ohotimur et al., 2019).

### **2.3. The SWOT analysis**

SWOT stands for Strengths, Weaknesses, Opportunities, and Threats. It is a very popular method, related to strategy analysis (Taghavifard et al., 2018). The SWOT method is employed to analyze both internal and external conditions of an institution, organization, or company as a first step in developing a research strategy (Kahraman, Birgun, & Yenen, 2008).

The outline of the SWOT method is as follows. First, researchers and experts determine the main factors of both internal SWOT, namely Strength (S) and Weaknesses (W); and the external factors, namely Opportunity (O) and Threats (T). These factors are determined based on documents, literature, and previous studies.

The next step is to determine an alternative strategy that is a combination of internal and external factors which will produce four categories which are S-O, W-T, S-T, and W-O (Taghavifard et al., 2018). The S-O strategy uses the internal strengths to take advantage of external opportunities (ideal case). The combination of S-O is often called a maxi-maxi strategy. W-T strategies are called 'mini-mini strategies'. These alternative strategies are aimed at reducing internal weaknesses and avoiding threats. S-T or “maxi-mini strategies” are used to reduce the impact of external threats. W-O is adopted to minimize weaknesses by utilizing opportunities. This strategy is also called “mini-maxi” (Mousavi & Behzadi, 2019).

The weakness of this method is that the identification of relevant factors only happens at a qualitative level. The SWOT method does not quantify or rank the factors identified. However, the SWOT method remains useful for identifying the state of the institution or organization as a first step in determining an appropriate strategy (Koca & Behdioğlu, 2017). SWOT can then be integrated with other methods such as AHP and fuzzy-AHP, so that quantification of relevant factors can be made and their importance can be calculated for further use. (Tavana, Zareinejad, Di Caprio, & Kaviani, 2016).

Saaty (2008) explained that there are three basic principles to the AHP method, namely decomposition, comparison of judgments, and priority synthesis (Ivanco, Hou, & Michaeli, 2017). Decomposition describes solving or dividing a problem into a hierarchical structure. Breaking down the problems into a hierarchy will help the researcher unravel the complexities (Raco et al., 2020). Decomposition is one of the ways to circumvent the limitations of human thought in dealing with a large amounts of information, allowing structured assessment of the trade-offs between conflicting criteria (Promentilla et al., 2018). The structure consists of three levels, namely the first level (goal), the second (criteria) and the third (alternatives) (Fabjanowicz, Bystrzanowska, Namie, Tobiszewski, & Justyna, 2018).

The analysis in strategic planning starts with environmental scanning of the organization, including the religious institution. In this analysis the strengths, potentials, challenges, and threats are observed. This can be done using the SWOT method (Oreski, 2012). SWOT analysis is a good tool used to dissect an organization or institution. The right choice of strategy can be obtained through understanding the relationship between internal and external factors (Roghanian, Ghorbani, & Alipour, 2018). SWOT analysis has become a very broad reference used for an instrument that analyzes an institution (Ghazinoory, Esmail Zadeh, & Memariani, 2007). Oreski added that SWOT is the most widely used method by managers to carry out strategic planning (Oreski, 2012). The greatest benefit of SWOT is its simplicity as it can be used and understood by anyone (Roghanian et al., 2018).

#### **2.4. Fuzzy-AHP**

The main input of the AHP method is the perception of experts, so there is a factor of subjectivity in the decision-making (Alzoubi, Mohammad, & Abu-Salma, 2015). This method also takes into account data validity due to inconsistency limits. However, considerable uncertainty and doubt in making an assessment will have an impact on the accuracy of the data and the results obtained, requiring the further use of a strategy known as the fuzzy Analytic Hierarchy Process.

Fuzzy Analytic Hierarchy Process (FAHP) is the AHP method developed in conjunction with fuzzy logic theory, specifically triangular fuzzy. The steps of solving a problem using the fuzzy AHP method are almost the same as the AHP method. The fuzzy AHP method changes the AHP scale into a triangular fuzzy scale to establish priorities.

A disadvantage of the AHP method is its limitation in eliminating subjective factors and inaccuracies because this method uses crisp (single) numbers (Esmaeili, Kahnali, Rostamzadeh, & Sepahvand, 2014). Inevitably, there will be nuances of gray (vagueness) and uncertainty in the respondents' perceptions. Therefore, the combination of SWOT-AHP with fuzzy is the right solution.

FAHP is widely used in research related to prioritization. Researchers use FAHP because fuzzy ratios help respondents provide answers related to imprecise and vague elements in pairwise comparisons. Additionally, respondents' uncertainty over their choices is reduced (Lohan, Ganguly, & Kumar, 2020) and it avoids the use of crisp numbers that are used in the AHP (Ganguly & Kumar, 2019).

The FAHP used in this study is Buckley's FAHP which presents a three-step decision-making process, namely finalize the weights, then normalize weights for all the attributes/factors and finally rank the alternatives (Lohan et al., 2020).

### **3. Method**

One of the limitations of the SWOT method is its inability to provide quantitative data that would be helpful to decision makers. To overcome this, the SWOT method is usually combined with other methods such as AHP and FAHP.

The combination of SWOT, AHP and FAHP assists the decision maker by establishing a priority indicated by the quantitative data. Current conditions, marked by rapid change in contemporary organizations or institutions are difficult to predict, due to prevailing uncertainties. Therefore a combination of these methods is very appropriate to use (Taghavifard, Mahdiraji, Alibakhshi, Zavadskas, & Bausys, 2018), and have been adopted for the present study. This research applies a hybrid method of SWOT, AHP and FAHP utilizing five steps.

The first step is a literature search to identify factors or criteria and sub-criteria regarding the management of religious congregations. The second step is to discuss the factors obtained through the literature in focused group discussions with MSC leaders to identify, discuss and explore in more depth the internal and external conditions of the MSC congregation using the SWOT method. The criteria, sub-criteria and the strategic alternatives of the SWOT analysis were later put into a hierarchical structure as shown in Figure 1 (explanation of the criteria and sub-criteria is provided in the Appendix).



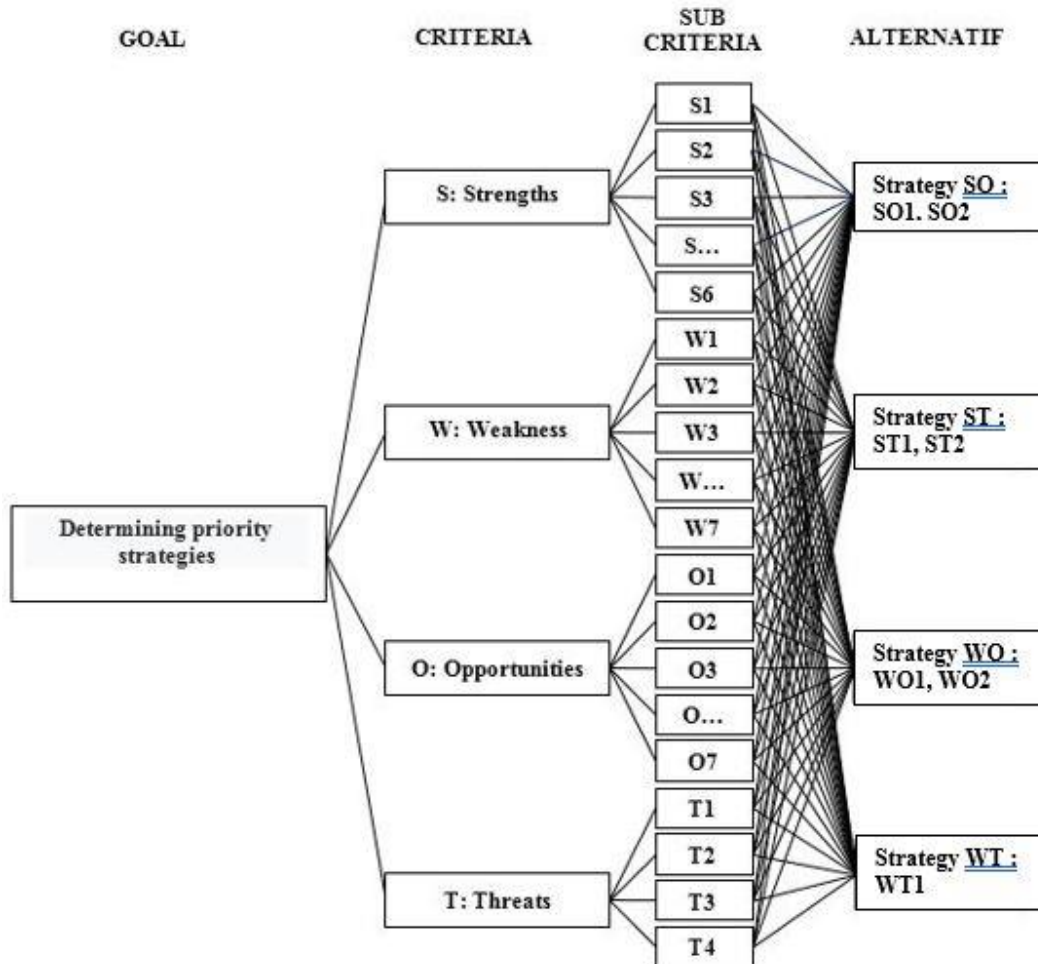


Figure 1 Hierarchy structure of the MSC development

In the third step, the researchers quantify the results of the SWOT analysis using the AHP method. The assessment is done by comparing the criteria in pairs using a numeric scale from 1 to 9. The scores of the assessment obtained are then arranged into a pairwise comparison matrix and a synthesis process is carried out to obtain the value of each criterion. The value of each criterion is obtained by calculating priority vectors (eigenvectors) from pairwise comparison matrices. For example, there are  $n$  criteria  $a_1, a_2, a_{\dots}, a_n$  with  $\frac{w_i}{w_j}$  ( $i = 1, 2, \dots, n, j = 1, 2, \dots, n$ ) the weight of the pairwise comparison, then a pairwise comparison matrix can be arranged based on Equation 1 as follows.

$$A = [a_{ij}], \quad a_{ij} = w_i/w_j, \quad a_{ji} = 1/a_{ij} \quad a_{ii} = 1 \quad (1)$$

Normalization of pairwise comparison matrices based on Equation 2 below:

$$b_{ij} = \frac{a_{ij}}{\sum_{i=1}^n a_{ij}} \quad (2)$$

Priority weights are obtained by averaging the rows in the normalized pairwise comparison matrix with the following Equation 3.

$$w_i = \frac{\sum_{j=1}^n b_{ij}}{n} \tag{3}$$

The AHP method expects some inconsistency in the results. Many questions are interrelated making it necessary to calculate the extent to which the results of the questionnaire are consistent (Mu & Pereyra-Rojas, 2018). If the opposite happens, then the process of filling out the questionnaire needs to be repeated. A consistency test is performed to determine the consistency of the respondent's perceptions (Mu & Stern, 2014). The basic principle of consistency testing is if  $A > B$ , and  $B > C$ , then it should be  $A > C$ .

The consistency test calculation steps are as follows:

Calculate the maximum eigenvalue ( $\lambda_{max}$ ) using Equation 4.

$$\lambda_{max} = \sum_{i=1}^n \frac{(Aw)_i}{nw_i} \tag{4}$$

Next, calculate the consistency index (CI) using Equation 5.

$$CI = \frac{\lambda_{max} - n}{n - 1} \tag{5}$$

The final step is to calculate the consistency ratio (CR). The consistency ratio value is the comparison between the consistency index (CI) and the random index (RI). The ratio consistency value is calculated according to the following Equation 6.

$$CR = \frac{CI}{RI} \tag{6}$$

Saaty (2008) compiled a random index obtained from an average of 500 matrix consistency indexes. The RI value is the RI value every  $n$  object with  $2 \leq n \leq 15$

Table 1  
Random Index (RI)

N	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
R.I	0	0	0.58	0.90	1.12	1.24	1.32	1.41	1.45	1.49	1.51	1.48	1.56	1.57	1.59

If the consistency ratio value ( $CR \leq 0,1$  (10%)), the respondent's perception is considered consistent and the results of other calculations are considered valid.

In theory, the respondent's perception is valid (perfect) if the value  $(CR) = 0$ . However, in practice this is difficult to achieve, given the complexity of the problems that influence the decision maker in making decisions. Therefore, the value of CR according to Equation 6 is the tolerance limit of the inconsistency of respondents' permitted perceptions. When consistent conditions are met using the AHP method, the researchers than proceed to the next step.

In the fourth step, the researchers proceeded with weighing the respondents' perceptions using Buckley's FAHP method (Hsieh, Lu, & Tzeng, 2004). The initial step of the Buckley's FAHP is to convert the perception of respondents on the AHP scale that has been completed on the questionnaire into the form of a fuzzy triangle number (TFN) on the FAHP scale (Table 2) (Cebeci, 2009)

Table 2  
Function members of linguistic scale

Linguistic scales	Scale of Fuzzy Number
Equally Important	(1, 1, 1)
Weakly Important	(1, 3, 5)
Fairly Important	(3, 5, 7)
Very Strongly Important	(5, 7, 9)
Absolutely Important	(7, 9, 9)

The steps to determine respondents' perception weights using the FAHP method according to Buckley as mentioned by Hsieh (2004) are as follows:

Step 1. Design pairwise comparison matrix for criteria, sub- criteria and alternatives with respect to each sub-criteria.

$$\tilde{A} = \begin{bmatrix} 1 & \tilde{a}_{12} & \cdots & \tilde{a}_{1n} \\ \tilde{a}_{21} & 1 & \cdots & \tilde{a}_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ \tilde{a}_{n1} & \tilde{a}_{n2} & \cdots & 1 \end{bmatrix} = \begin{bmatrix} 1 & \tilde{a}_{12} & \cdots & \tilde{a}_{1n} \\ 1/\tilde{a}_{12} & 1 & \cdots & \tilde{a}_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ 1/\tilde{a}_{1n} & 1/\tilde{a}_{2n} & \cdots & 1 \end{bmatrix} \quad (7)$$

With,

$$\tilde{a}_{ij} = \begin{cases} \tilde{1}, \tilde{3}, \tilde{5}, \tilde{7}, \tilde{9}, & \text{criterion } i \text{ is relative importance to criterion } j \\ 1, & i = j \\ \tilde{1}^{-1}, \tilde{3}^{-1}, \tilde{5}^{-1}, \tilde{7}^{-1}, \tilde{9}^{-1}, & \text{criterion } i \text{ is relative less importance to criterion } j \end{cases}$$

Step 2. Calculate the geometric mean of fuzzy comparison value of criterion  $i$  to each criterion using the following formula,

$$\tilde{r}_i = (\tilde{a}_{i1} \otimes \tilde{a}_{i2} \otimes \dots \otimes \tilde{a}_{in})^{1/n} \tag{8}$$

Where,  $\tilde{a}_{in}$  is fuzzy comparison value of criterion  $i$  to criterion  $n$ .

Step 3. Determine fuzzy weight of each criterion indicated by triangular fuzzy number

$$\tilde{w}_i = \tilde{r}_i \otimes (\tilde{r}_1 \oplus \dots \oplus \tilde{r}_n)^{-1} \tag{9}$$

Where,  $\tilde{w}_i$  adalah fuzzy weight of the  $i$ th criterion and can be indicated using triangular fuzzy number,  $\tilde{w}_i = (Lw_i, Mw_i, Uw_i)$ .  $Lw_i, Mw_i$  and  $Uw_i$  mean is lower, middle and upper value of the fuzzy weight of the  $i$ th criterion.

Step 4. The process of defuzzification using the Centre of Area method to get the weight of Best Nonfuzzy Performance (BNP) applying Equation 10,

$$BNP_{w_i} = [(Uw_i - Lw_i) + (Mw_i - Lw_i)]/3 + Lw_i \tag{10}$$

Step 5. Calculate the weight and rank of the alternatives.

The alternatives' weight with respect to each criteria is calculated using the Equations 8 - 10. The final value for each alternative is obtained by multiplying the alternative weight with the weight of the corresponding sub-criteria (Cebeci, 2009). Then, the calculation of BNP of each alternative is performed applying Equation 10.

The fifth step consisted of a sensitivity analysis. A sensitivity analysis or "what-if" analysis is performed to determine whether there will be a change in the results if the value of the criteria changes. A sensitivity analysis aims to determine how robust the results are. At the same time, a sensitivity analysis provides information about the main driver (Mu & Pereyra-Rojas, 2018). A sensitivity analysis will guarantee the stability of the results against the various assessments (Mu & Stern, 2014).

## 4. Results

### 4.1. SWOT factors

Researchers and experts identified SWOT factors and sub-factors, later known as criteria and sub-criteria, guided by seven elements which are as follows: identity, leadership, personnel, structure, mission, environment, facilities or infrastructures (Table 3).

Table 3  
SWOT factors and sub-factors

<b>SWOT Factors (Criteria)</b>	<b>SWOT Sub Factors (Sub criteria)</b>	<b>Elements</b>
Strength	S1. Inspired by Heart Spirituality S2. Participative and subsidiarity style of leadership S3. Increasing number of members; Members are more productive; Parish ministry; Professional and expertise members S4. National and international ministry; 100 years of service; Fraternity of community life S5. Community-based congregation S6. Having formation centers; Own property assets	Identity Leadership Personnel  Structure Facilities and infrastructure
Weakness	W1. Heart Spirituality is not yet comprehensive; W2. Having limited qualified leaders; Having limited integrated-program of Heart Spirituality promotion W3. Lack of assistance to elderly members; Lack of professional assistance W4. Having less categorized ministry; Having limited productive work W5. Weak fighting spirit of the young members W6. Protocol to handle problems in congregation is not yet available. W7. There is no nursing facility; IT-based ministry not yet available; Having limited funding for ministry development and promotion; Regulation of assets use is not available	Identity Leadership Personnel Mission Environment Structure Facilities and infrastructure
Opportunities	O1. Huge opportunities to strengthen Heart Spirituality O2. Congregation can develop a good corporate governance; Strengthening cooperation with government, Dioceses in the country and abroad; Chances to upgrade visitation program and job description of MSC leaders at provincial level. O3. Regeneration programs for young members; Improve quality and professionalism of training; Opportunities to upgrade education of the Brothers O4. Develop family ministry; Catechism for people; Develop the accompaniment of Chevalier's families; Managing the faithful's support O5. Expand the charity movement of the faithful O6. Improve the function and role of community O7. Chances to boost revenues and assets; Improve financial management; Investment in credible	Identity Leadership Personnel Mission Environment Structure

<b>SWOT Factors (Criteria)</b>	<b>SWOT Sub Factors (Sub criteria)</b>	<b>Elements</b>
	financial institution; Develop management of inheritance; Intensify the fund raising	
Threats	T1. Ministry not based on IT and strategic planning T2. For young people, priesthood is not first choice; Freedom inspired by modernity threaten identities T3. Problems in family are threatening the vocation; Diocesan priests overtake ministry of the MSC T4. Post-modern fluidity and hedonism; Family numbers getting smaller; Spirit of the age weakening the militancy struggles of young members; Extensive negative publication due to clergy sex abuse.	Leadership Identity Mission Environment

#### **4.2. Factors of strategic alternatives**

Development strategies of the MSC were structured by researchers and experts using a combination of the identified internal and external factors of SWOT. There were four strategic alternatives which were S-O, S-T, W-T and W-O.

The elements of each strategic alternative were as follows:

SO 1: intensifying the improvement of human resources

SO 2: enhancing the MSC structure to be more dynamic and accessible to all members

ST 1: disseminating Heart Spirituality

ST 2: empowering fraternal community

WO1: strengthening networking

WO2: revitalizing family ministry

WT1: strengthening the Heart Spirituality at all levels of the community

#### **4.3. Data analysis**

##### **4.3.1. Consistency test**

The respondents in this study are 16 members of the MSC region of Sulawesi. They met the criteria to be respondents (Raco & Tanod, 2014) because they are the decision makers who have been deeply involved with MSC, holding and sharing all the relevant information needed by the researchers. The respondents completed the questionnaires that were in pairwise comparison matrix form. Then, the researchers aggregated the data using a geometric mean formula. Afterwards, the data was analyzed using the AHP method by applying Equations 1- 6 to determine the consistency of the respondents' answers. Based on the consistency test on criteria, sub-criteria and alternatives, the results showed that the consistency ratio of all elements was less than 10% or  $(CR) < 0.1$ . The researchers concluded that the results were valid and accepted.

##### **4.3.2. Perception weighting using Fuzzy-AHP**

Once the consistency of the data was approved, the research process was extended by applying the FAHP. The respondents' assessments were then aggregated along with the structure in fuzzy pairwise comparison matrix for each criterion, sub-criteria and

alternatives. The fuzzy pairwise comparison matrix of the level of importance for the criteria is shown in Table 4 below.

Table 4  
Fuzzy pairwise comparison matrix of the level of importance for the criteria

Criteria	S	W	O	T
S	(1, 1, 1)	(1.47, 2.11, 2.73)	(0.91, 1.28, 1.66)	(1.27, 1.87, 2.64)
W	(0.37, 0.47, 0.68)	(1, 1, 1)	(0.37, 0.51, 0.91)	(0.83, 1.05, 1.38)
O	(0.60, 0.78, 1.10)	(1.10, 1.96, 2.73)	(1, 1, 1)	(1.38, 2.39, 3.16)
T	(0.38, 0.53, 0.79)	(0.73, 0.95, 1.21)	(0.32, 0.42, 0.73)	(1, 1, 1)

Determining the geometric mean of fuzzy comparison value of criteria, strength, using Equation 8 as follows:

$$\begin{aligned} \tilde{r}_S &= (\tilde{a}_{11} \otimes \tilde{a}_{12} \otimes \tilde{a}_{13} \otimes \tilde{a}_{14})^{1/4} \\ &= ((1 \times 1.47 \times 0.91 \times 1.27)^{1/4}, (1 \times 2.11 \times 1.28 \times 1.87)^{1/4}, (1 \times 2.73 \times 1.66 \times 2.64)^{1/4}) \\ &= (1.142, 1.499, 1.861) \end{aligned}$$

Using the same method to obtain the geometric mean of fuzzy comparison value of the other criteria as follows:

$$\begin{aligned} \tilde{r}_W &= (0.577, 0.710, 0.959) \\ \tilde{r}_O &= (0.978, 1.384, 1.755) \\ \tilde{r}_T &= (0.543, 0.679, 0.912) \end{aligned}$$

Next, determine the weight of the criteria, strength, based on Equation 9 as follows:

$$\begin{aligned} \tilde{w}_S &= \tilde{r}_S \otimes (\tilde{r}_S \oplus \tilde{r}_W \oplus \tilde{r}_O \oplus \tilde{r}_T)^{-1} \\ &= (1.142, 1.499, 1.861) \otimes (1/(1.861 + 0.959 + 1.755 + 0.912), 1/(1.499 + 0.710 + 1.384 + 0.679) + 1/(1.142 + 0.577 + 0.978 + 0.543)) \\ &= (0.208, 0.351, 0.574) \end{aligned}$$

We also get the weight of other criteria as follows:

$$\begin{aligned} \tilde{w}_W &= (0.105, 0.166, 0.296) \\ \tilde{w}_O &= (0.178, 0.324, 0.542) \\ \tilde{w}_T &= (0.099, 0.159, 0.281) \end{aligned}$$

Furthermore, the Best Nonfuzzy Performance (BNP) value for the strength criteria is calculated based on Equation 10 as follows:

$$\begin{aligned} BNP_{w_S} &= [(Uw_S - Lw_S) + (Mw_S - Lw_S)]/3 + Lw_S \\ &= [(0.574 - 0.208) + (0.351 - 0.208)]/3 + 0.208 \\ &= 0.378 \end{aligned}$$

In the same way the BNP value can be calculated for other criteria and the results as follows:

$$BNP_{wW} = 0,189$$

$$BNP_{wO} = 0,348$$

$$BNP_{wT} = 0,180$$

The weights for each sub-criterion are calculated in the same way using Equations 8, 9 and 10 and the results are listed in the following table.

**Table 5**  
Local and overall weight of criteria and sub-criteria

Criteria and Sub Criteria	Local Weight		Overall Weight	
	Fuzzy	BNP and Normalized	BNP and Normalized	BNP and Normalized
<i>Strength</i>	(0.21, 0.35, 0.57)			0.345
S1	(0.15, 0.28, 0.48)	0.268		0.093
S2	(0.12, 0.23, 0.43)	0.228		0.079
S3	(0.07, 0.14, 0.27)	0.145		0.050
S4	(0.05, 0.09, 0.20)	0.103		0.035
S5	(0.09, 0.15, 0.27)	0.152		0.052
S6	(0.06, 0.10, 0.19)	0.105		0.036
<i>Weakness</i>	(0.11, 0.17, 0.30)			0.173
W1	(0.10, 0.21, 0.41)	0.205		0.035
W2	(0.08, 0.17, 0.35)	0.172		0.030
W3	(0.08, 0.15, 0.29)	0.149		0.026
W4	(0.05, 0.10, 0.20)	0.101		0.017
W5	(0.07, 0.12, 0.25)	0.126		0.022
W6	(0.06, 0.11, 0.23)	0.115		0.020
W7	(0.07, 0.13, 0.26)	0.131		0.023
<i>Opportunities</i>	(0.18, 0.32, 0.54)			0.318
O1	(0.10, 0.18, 0.31)	0.178		0.057
O2	(0.09, 0.15, 0.25)	0.146		0.046
O3	(0.09, 0.16, 0.28)	0.161		0.051
O4	(0.09, 0.15, 0.25)	0.149		0.047
O5	(0.06, 0.10, 0.21)	0.108		0.034
O6	(0.07, 0.13, 0.24)	0.135		0.043
O7	(0.07, 0.12, 0.21)	0.124		0.039
<i>Threats</i>	(0.10, 0.16, 0.28)			0.164
T1	(0.14, 0.23, 0.42)	0.238		0.039
T2	(0.14, 0.28, 0.52)	0.282		0.046
T3	(0.13, 0.22, 0.41)	0.225		0.037
T4	(0.15, 0.26, 0.43)	0.254		0.042

The pairwise comparison, geometric mean of fuzzy comparison value, and the weights of each alternative with respect to the corresponding sub-criterion were calculated in the same way using Equations 8 and 9 and the results are listed in the following tables.

The final alternative value is obtained by multiplying the weight of each alternative with the corresponding sub-criterion weight, the results are listed in Table 6.



**Table 6**  
Final alternative value

Sub Crit	Sub Crit. Weight (BNP)		Alternative								
	Local	Overall	Local Weight (BNP)				Global Weight (BNP)				
			SO	ST	WO	WT	SO	ST	WO	WT	
A	B	C	D	E	F	G	$H = D * C$	$I = E * C$	$J = F * C$	$K = G * C$	
S1	0.268	0.093	0.314	0.278	0.216	0.249	0.029	0.026	0.020	0.023	
S2	0.228	0.079	0.352	0.288	0.166	0.277	0.028	0.023	0.013	0.022	
S3	0.145	0.050	0.359	0.285	0.165	0.256	0.018	0.014	0.008	0.013	
S4	0.103	0.035	0.322	0.289	0.188	0.283	0.011	0.010	0.007	0.010	
S5	0.152	0.052	0.325	0.305	0.188	0.255	0.017	0.016	0.010	0.013	
S6	0.105	0.036	0.339	0.291	0.205	0.240	0.012	0.011	0.007	0.009	
W1	0.205	0.035	0.356	0.271	0.178	0.299	0.013	0.010	0.006	0.011	
W2	0.172	0.030	0.366	0.281	0.197	0.261	0.011	0.008	0.006	0.008	
W3	0.149	0.026	0.316	0.315	0.196	0.302	0.008	0.008	0.005	0.008	
W4	0.101	0.017	0.298	0.288	0.299	0.232	0.005	0.005	0.005	0.004	
W5	0.126	0.022	0.328	0.286	0.210	0.305	0.007	0.006	0.005	0.007	
W6	0.115	0.020	0.321	0.280	0.201	0.281	0.006	0.006	0.004	0.006	
W7	0.131	0.023	0.361	0.278	0.199	0.281	0.008	0.006	0.005	0.006	
O1	0.178	0.057	0.258	0.342	0.195	0.312	0.015	0.019	0.011	0.018	
O2	0.146	0.046	0.399	0.271	0.244	0.230	0.018	0.013	0.011	0.011	
O3	0.161	0.051	0.429	0.266	0.188	0.238	0.022	0.014	0.010	0.012	
O4	0.149	0.047	0.270	0.240	0.321	0.271	0.013	0.011	0.015	0.013	
O5	0.108	0.034	0.232	0.274	0.346	0.266	0.008	0.009	0.012	0.009	
O6	0.135	0.043	0.325	0.295	0.172	0.286	0.014	0.013	0.007	0.012	
O7	0.124	0.039	0.348	0.291	0.215	0.265	0.014	0.011	0.008	0.010	
T1	0.238	0.039	0.265	0.279	0.256	0.270	0.010	0.011	0.010	0.011	
T2	0.282	0.046	0.368	0.238	0.290	0.226	0.017	0.011	0.013	0.010	
T3	0.225	0.037	0.316	0.272	0.282	0.231	0.012	0.010	0.010	0.009	
T4	0.254	0.042	0.310	0.261	0.236	0.253	0.013	0.011	0.010	0.011	
							SUM	0.329	0.282	0.219	0.264

The final results appear in Table 7.

**Table 7**  
Final results of alternatives, BNP after normalization and ranking

Alternative	BNP and Normalized	Ranking
SO	0.301	1
ST	0.258	2
WO	0.201	4
WT	0.241	3

### 5. Sensitivity analysis

A sensitivity analysis was carried out to understand the robustness of the decision priorities obtained as a result of the analysis in determining the overall priority. In addition, the sensitivity analysis helped determine which criteria are very influential in the original results.

It is understood that the overall priorities of criteria are influenced by the weight of each criterion. For this reason, a sensitivity analysis was carried out using a "what-if" analysis to determine the change in the final results if the weight of the criteria changed.

Various scenarios were assumed in the sensitivity analysis, and the results are listed in Table 8 below.

Table 8  
Scenarios in sensitivity analysis

Scenario	Weight of Criteria (BNP)				Overall priority of Alternative (BNP and Normalized)			
	S	W	O	T	SO	ST	WO	WT
Original	0.345	0.173	0.318	0.164	0.301	0.258	0.201	0.241
Sc1	0.250	0.250	0.250	0.250	0.300	0.255	0.205	0.240
Sc2	0.100	0.300	0.300	0.300	0.298	0.252	0.210	0.240
Sc3	0.300	0.100	0.300	0.300	0.299	0.255	0.208	0.238
Sc4	0.300	0.300	0.100	0.300	0.302	0.255	0.203	0.240
Sc5	0.300	0.300	0.300	0.100	0.302	0.258	0.197	0.244

In scenario 1, the criteria weights are made equal, each as 0.25. The results show that alternative SO remains the first priority and there is no significant change in the value of the alternative. The alternative rankings do not change from the original, which are SO, ST, WT, WO going from largest to smallest.

Scenarios 2 to 5 weigh three (3) criteria equal to 30% each, while one criterion is 10%. As a result, alternative SO remains first, and the alternative ranking order remains, respectively from the largest SO, ST, WT, WO.

These results indicate that changes in the criterion weights do not affect the alternative rankings. Thus, it can be concluded that the decisions made by the decision maker are very solid.

## 6. Discussion

SWOT analysis is very useful in assessing our situation (Wickramasinghe & Takano, 2010). The combination of SWOT and FAHP was helpful in formulating strategic planning quantitatively that can reveal the priorities that need to be addressed. Even though the respondents' sample is small, a combination of the two methods can be done based on the knowledge, lived-experience, and rich information provided by the respondents.

Through the calculation of the consistency ratio, the researchers found that all the data are consistent, so the analysis is acceptable.

The results showed that the alternative strategy S-O received 30.1%, which was the highest. The alternative strategy of S-O is about the intensification and improvement of human resources, thus enhancing the MSC structure to be more dynamic and accessible to all members. It means that the MSC should give priority to creating a program to improve their human resources and strengthen their structure to be more dynamic and accessible to all members. According to Wickramasinge & Takano (2009), the position of S-O was the ideal position because it means that the institution has a strong internal

environment. Therefore, internally the MSC is strong. This is also evident in the calculation of criteria where this strength was at the highest level (34.5%). The strength was shown in sub-criterion S1 that was the identity of the MSC, which is inspired by Sacred Heart Spirituality. Other strengths of the congregation were demonstrated in sub criterion S2 (7.9%) highlighting the participative and subsidiarity style of leadership. Through the S-O strategy, the MSC must maximize its internal strengths to take greater advantage of its external opportunities. This is called a maxi-maxi strategy.

The second strategy is S-T (25.8%), which refers to disseminating Sacred Heart Spirituality and empowering fraternal community. The findings required the MSC to optimize its strengths to eliminate its external threats. The data showed the external threat of sub criterion T2 (4.6%), which was about the modern era that offers attractive facilities and unlimited freedom for people, to a degree that has made the priesthood not interesting especially for the younger generation. However, sub criterion S1 (9.3%) is greater than sub criterion T2 (4.6%). The results recommended that MSC place strategy S-T as the second priority in their program.

The third strategy is W-T (24.1%) which is to strengthen the Sacred Heart Spirituality in all levels of the community. The data showed that sub criterion W1 (3.5%), which is the Spirituality of the Heart is not yet comprehensive. The findings recommended that the MSC should reduce its internal weaknesses to eliminate its external threats. In other words, the MSC has to do its best to diminish the percentage of W1 to eliminate its threats.

The fourth strategy is W-O (20.1%), which is strengthening the congregation's capacity for networking and revitalizing the family ministry. The W-O strategy required the MSC to reduce its weaknesses by taking advantages of its opportunities. The sub criterion O1 (5.7%) indicated that the MSC has huge opportunities to strengthen Sacred Heart Spirituality which can be maximized to minimize its weaknesses. Putting all the above into a program for action, the first priority strategy of S-O should become a short-term program and is very urgent. The second strategy of S-T then becomes the middle-term program, and the third (W-T) and fourth strategies (W-O) can be a long-term undertaking.

## **7. Conclusion**

This study aimed to determine the priorities for strategic planning of the MSC using a combination of SWOT and FAHP analysis. The combination of these two methods is adequate to determine the priorities quantitatively. The SWOT analysis is used to scan the internal and external elements of an organization as an initial step of strategic planning. The FAHP is useful to minimize the vagueness and uncertainties of human thoughts and perceptions.

The research findings are congruent because all the data analysis of the criteria, sub-criteria and alternatives are consistent. The findings indicate that the S-O (30.1%) was the highest priority. This strategy was related to intensifying the improvement of human resources and enhancing the MSC structure to be more dynamic and accessible to all members. The second was S-T (25.8%), which is related to the dissemination of Sacred

Heart Spirituality and empowering fraternal community among the members. W-T (24.1%) is the third strategy which aims at strengthening the Sacred Heart Spirituality at all levels of the community. Finally, W-O (20.1%) aims at strengthening the congregation's capacity for networking and revitalizing the family ministry.

The results of the sensitivity analysis reinforce the SO strategy as the main strategy that must be a priority in preparing the MSC congregation's future development program. The findings reveal that the members of the congregation believe that the Spirituality of the Heart is the primary incentive for animating the members. It also distinguishes them from other religious congregations. This is the internal strength proudly possessed by the MSC. Internally, this congregation is strong and its future looks quite promising. However, further work is required to deepen the Sacred Heart Spirituality amongst the members of the congregation.

The main contribution of this study is that it objectifies and quantifies the strategic priorities for the future renewal of the MSC congregation. The combination of methodologies involved is very helpful for MSC leaders to determine strategic priorities for the future.

As already stated, the researchers claim that this is a pioneering study adopted for the first time in the Catholic Church – by the MSC congregation - using a combination of SWOT and fuzzy-AHP analysis. There are some limitations to such a study. Some respondents prefer other options, to honor a variety of tastes and experiences. The researchers also recommend that further studies be carried out on the expectations of young people interested in joining the MSC congregation, or becoming involved in its various ministries.

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## **APPENDIX**

Model element definitions of the goal, criteria and sub-criteria. These definitions refer to the elements of the model in Figure 1.

1. Goal: The goal is to determine the strategic priorities of the MSC using SWOT and Fuzzy-AHP. Those priorities' factors will form the basis of designing the congregation's future programs.

The assumptions are:

- a. The respondents are really experts who know about the congregation and are acting as decision makers.
- b. The internal and external factors were shared by the experts based on the Constitutions and Statutes of the Missionaries of the Sacred Heart of Jesus and the results of the Congregation Chapter.
- c. Information provided by the experts is true and trustworthy. Whenever there were questions, experts were contacted and required to reply in writing.

2. Criteria: The key criteria below will be used to decide the strengths, opportunities, weaknesses and threats. Each of criteria has some sub-criteria that will be used in the assessment of strategic priorities of the MSC.

2.1. Strength: Strength is the characteristic that adds value, advantages that make this congregation special, more effective and efficient internally than other organizations or congregations. This criterion refers to most supporting internal conditions of the congregation that inspired their ministries. There are seven sub-criteria: (inspired by heart spirituality, participative and subsidiarity style of leadership, increasing number of members who are more productive, either as parish priests or as professionals, having national and international ministry supported by fraternity community living and already in service for 100 years in the diocese of Manado, community based congregation, having formation centers and own property assets).

2.1.1. Inspired by heart spirituality that animates all members and their activities.

2.1.2. Participative and subsidiarity style of leadership

2.1.3. Increasing number of members who are more productive and serve some dioceses

2.1.4. Emphasis on fraternity amongst members

2.1.5. Community living

2.1.6. Having formation centers; own property assets

2.2. Weaknesses: something that is internally owned by the MSC which is more disadvantageous, negative and unfavorable when compared to something else. In other words, the aspects or activities of MSC that are less effective and efficient compared to its competitors. A weakness is something an organization lacks or does poorly -in comparison to others- or a condition that puts it at a disadvantage. There are seven sub-criteria of weaknesses:



- 2.2.1. The spirit of the heart that is not yet deep
  - 2.2.2. Having limited qualified leaders
  - 2.2.3. Lack of assistance to elderly members; lack of professional assistance
  - 2.2.4. Having less categorized ministry;
  - 2.2.5. Weak fighting spirit of the young members.
  - 2.2.6. Protocol to handle problems in congregation is not yet available
  - 2.2.7. IT based ministry not yet available;
- 2.3. Opportunities: Opportunity means a situation or condition (external) suitable for an activity. Opportunity is an advantage and the driving force for an activity to take place. For this reason, it has a positive and favorable characteristic. For organizational management, an opportunity is the convenient time or situation that the environment presents to the organization to achieve its goals. Opportunities are those that would yield positive results for the organization determined as a result of the analysis of its environment. Competition and the intense work present organizations big opportunities. In fact, “opportunities are conditions in the external environment that allow an organization to take advantage of organizational strengths, overcome organizational weaknesses or neutralize environmental threats. There are seven sub-criteria of opportunities.
- 2.3.1. Huge opportunities to strengthen heart spirituality
  - 2.3.2. Offer from other Diocese abroad for MSC to do pastoral service in the country
  - 2.3.3. There some vocation to be MSC Brother.
  - 2.3.4. Pastoral service for family still open to MSC
  - 2.3.5. Expand the charity movement of the faithful
  - 2.3.6. Improve the function and role of community
  - 2.3.7. Chances to boost revenues and assets; improve financial management; investment in credible financial institution; develop management of inheritance; intensify the fund raising
- 2.4. Threats: A threat is a situation or condition (dari luar) that jeopardizes the actualization of an activity. It refers to a disadvantageous situation. For this reason, it has a negative characteristic that should be avoided. For organizational management, a threat is the element that makes it difficult or impossible to reach organizational goals. Threats are the situations that come out as a result of the changes in the distant or immediate environment that would prevent the organization from maintaining its existence or lose its superiority in competition, and that are not favorable for the organization. Four sub-criteria of threats:
- 2.4.1. There is no measurable strategic planning
  - 2.4.2. Modernism and challenges to celibacy especially for young people. For young people, priesthood is not a first choice; freedom inspired by modernity threatens self-identity.

- 2.4.3. The number of diocesan priests is increasing and overtaking the ministry of the MSC.
- 2.4.4. Government-sponsored family planning produces small family (husband and wife plus two children). Post-modern fluidity of hedonism; family sizes getting smaller; spirit of the age (instant culture) weakening the militancy struggles of young members; extensive negative publication due to clergy sex-abuse
- 3. S-O identified as using the internal strength to take advantage of external opportunities (ideal case). The combination of SO is often called a 'maxi-maxi' strategy. (S1; S2; O1; O3; O4)
  - 3.1. Intensifying the important of human resources
  - 3.2. Enhance the MSC structure to be dynamic and accessible to all members
- 4. S-T identified as 'maxi-mini' strategy: increase the strength to reduce the impact of external threats
  - 4.1. Dissemination of heart spirituality
  - 4.2. Empowering fraternal community
- 5. W-O: (mini-maxi) to minimize weaknesses by utilizing opportunities
  - 5.1. Strengthening networking
  - 5.2. Revitalizing family ministry
- 6. W-T: called 'mini-mini', aimed at reducing internal weaknesses and avoiding threats
  - 6.1. Strengthening the heart spirituality at all levels of the community