

An Alternative Soft Set Approach for Identifying Football Conflict: A Case Study of Indonesian Football Super League

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Abstract— Conflict situations in football have become a significant issue because they affect the players, supporters, referees, management team, the governing body of football, and the government. As time passes, the discovery of conflicts within the football industry has also become increasingly diverse; both affected in-game or out of the game. In 2015, Indonesia had no activity in football for almost a year when the International Federation of Association Football (FIFA) banned the Football Association of Indonesia (PSSI) from competing in international competitions until the conflict among their internal agents was resolved. The agents involved in this highly controversial ban include the Commission 10 of the Parliament of Indonesia, the National Sports Committee of Indonesia (KONI), the Indonesian President, and the Ministry of Youth and Sport of Indonesia. Conflict resolution strategies outside the football games are delicate and more challenging to overcome due to the involvement of the government and various governing bodies. This opens to higher unpredictability in modeling the conflict situations, hence a lower possibility of a successful conflict resolution model strategy. In addressing this gap, this paper proposes a new Computational Intelligence approach based on the Soft Set Theory, where an alternative algorithm is derived from modeling the conflict situations. We then delineated the proposed algorithm for an instructional example of the Indonesian football conflict situation in 2015 concerning the Indonesia Football Super League. The results showed that the proposed algorithm successfully handled conflict and recommended the Indonesian football agents involved, including PSSI and FIFA.

Keywords—Football; conflict; decision making; soft set.

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I. INTRODUCTION

Football serves a variety of functions. This sport grew into a competition, business and betting, starting as entertainment or just a game. Hence it is crucial to a country's reputation. The rapid development of the football industry is directly proportional to the conflict, which would damage the industry's reputation at the international level. Recently, conflict situations in football have become a significant issue because they affect the players, supporters, referees and the management team, the governing body of football, and the government. As time passes, the discovery of conflicts within the football industry has also become increasingly diverse; both affected in-game or out of the game. The in-game

conflict mainly arises from a fight among players in the same team, a fight among players across different teams, players attacking supporters and vice versa, players or supporters attacking the referee, until the fight between coaches. However, conflicts outside of the game are more damaging. It involves fights between supporters, mismatched team legality, arrears in the players' salary, tax arrears by the team, lack of facilities, corruption, match-fixing, violation of competition law, and many others.

In Indonesia, a major football conflict began when the Ministry of Youth and Sports of Indonesia initiated a plan for the national football in Indonesia to be more professional in 2015. Through the Professional Sports Agency of Indonesia (BOPI), the Ministry of Youth and Sports of Indonesia

uncovered several problems in each event of the Indonesian football competition organized by the Football Association of Indonesia (PSSI). Most of the problems were never resolved, resulting in competition delay to the extent of the unknown time limit. The problems became uncontrollable when FIFA officially sanctioned the Indonesian football industry, whereby in 2015, PSSI could not hold any competition. This event forced the Ministry of Youth and Sports of Indonesia, Imam Nahrawi, to impose administrative sanctions for all sports activities by the PSSI [1]. The impact ranged from clubs' dispersion and abandoned player salaries. At the peak of the conflict, the image of Indonesia at the international level was humiliated when one Indonesian team failed to hold the final 16 of the Asian Football Confederation (AFC) Cup.

Given the nature of the conflicts, conflicts outside the football games are more challenging to overcome because they often involve the governing body of football itself and the government. Three binary relations became most unpredictable; coalition (alliance or favorable), neutrality, and conflict (against) among agents. The research gap lies in modeling the unpredictability in conflict situations based on these binary relations [2], [3]. Aside from building the mathematical models for handling conflict analysis, one of the most popular approaches is using the rough set theory [4]–[6]. To date, many existing works employ rough set theory for handling conflict situations in view of these three binary relations, i.e., alliance, neutrality, and conflict. Pawlak [2], [3] produced the axioms for binary relations on conflict and alliance. Concerning the discernibility functions, [6] defined a conflict graph model and proposed another method to analyze conflict situations in [5]. [7] employed the rough set method to multi-attribute decision analysis, including handling conflict situations, while [8] presented an overview for modal and quantifier logics based on rough set semantics. They have also developed some new applied logic inspired by rough set theory, resulting from the links between logic and rough set notions.

Given rough set theory, [9] presented the idea of handling conflict situations as an extension of the method previously proposed by [2], [3]. The work proposed using interval importance for presenting the expert's knowledge and practicing it towards conflict analysis. The literature has shown that rough set theory has been widely used in conflict analysis and negotiation [10], [11], coalitions determination and selection strategy in analyzing the conflict [12], agent-based conflict analysis [13], managing conflicts in information systems [14], approximation spaces for the model of generalized conflict and resolution [15], decision tables [16], discernibility and indiscernibility in handling conflict analysis [17], optimization methods to improve the rough set partition sizes [18], collaborative design conflict management and resolution method [19], and finally as a case study in analyzing conflict to a public engagement program of Hong Kong's urban planning [20].

Another method for handling uncertainty, as in football conflicts, is based on soft set theory [21], [22]. Research has shown that every rough set is a soft set. Hence studies on soft set theory have been growing rapidly in both theoretical and practical aspects. [23] presented the notion of soft set theory and its algebraic properties while [24] generalized soft set theory from crisp to the fuzzy case. Among works based on

the soft theory include the new operations [25], application in abstract algebra, i.e., soft groups [26], d -algebras [27], exclusive disjunctive soft sets, and their algebraic properties [28], and description logics [29]. A variety of methodologies are available such as representing the relations between rough and soft sets via topological approach [30] as well as soft topological spaces [33], neutrosophic soft sets [31] and interval-valued neutrosophic soft sets [32], multi-sets [33], and hybrid of soft and rough sets based on their topological properties [34].

In practical application, soft set theory is popular for parameterization reduction during decision making. Firstly, the idea of parameterization reduction and decision making was proposed by [35], who used the rough set dimensionality reduction applied to soft-parameterization reduction. [36] presented another view of parameterization reduction using soft sets and its applications to improve the reduction model proposed by [35]. Subsequently, [37] presented the idea of the normal parameter reduction of soft sets and its algorithm to improve the work by [36] in maintaining the consistency of all decisions across all levels. Then, [38] further improved the work by [37] by proposing a new efficient normal parameter reduction algorithm of soft sets and reported a better computational time performance than the previous works. Finally, [39] redefined soft set operations and constructed a UniInt decision-making model.

In decision-making involving incomplete soft sets, [40] first presented data analysis approaches of soft sets for Boolean-valued information systems. Further improvement of this work involved a novel data filling method for improving the computational time issues [41], [42], application of neutrosophic parameterized soft sets [43], [44], and a novel soft rough set through soft rough hemirings and its application for multi-criteria group decision making [45]. In a more recent development, the literature has shown substantial work on hybridizing the soft set theory with other theories, mainly in fuzzy logic such as in decision-making problems [46]–[51] and parameter reduction [52].

Soft set theory has also been widely applied in knowledge discovery, such as texture classification [53], maximal association rules mining [54], [55], classification of numerical data based on fuzzy soft set theory [56], attribute selection for clustering [57]–[59], sounds classification [60], medical diagnosis [61], as well as tumor classification using attribute selection with information gain ratio in fuzzy rough set theory [62]. The most recent work by [63] proposed the notions of alliance (coalition), neutrality, and conflict (against) among agents in a conflict situation using the model of constraint co-occurrence in multi-soft sets. Motivated by the work of [55], this paper presents an alternative approach based on soft set theory to handle conflict situations. However, unlike the existing soft set-based methods that are based on parameter co-occurrence, this work is based on the concepts of conflict functions and the degree of conflict.

The remaining of this paper is organized as follows. Section 2 presents the materials and methods of the soft set approach in handling football conflict and the case study of conflict in the Indonesian Super League. Section 3 presents the results from the case study. Finally, Section 4 concludes this paper with some directions for future research.

II. MATERIALS AND METHODS

This paper proposes a soft set approach to conflict handling elucidated on real-world conflict situations, which as the Indonesia football Super League problem in 2015. The soft set approach is capable of handling conflict and finally making a recommendation to the Indonesian football agents involved.

A. Soft Set Approach to Handling Conflicts

In Soft Set theory, let U be an initial non-empty universe set and let E be non-empty set of parameters concerning object in U . The set denotes the power set of U . The notion of soft set theory is given in the following definition.

Description 1: A pair (F, E) is called a soft set over U where F is a mapping given by $FEP(U)$. From Definition 1, the soft set is clearly a parameterized family of subsets of the set U . In [55], it has been presented that a "standard" soft set (F, E) can be characterized as a Boolean-valued information system $(U, A, V[0,1], f)$. Therefore, the above soft set can be characterized as a Boolean-valued information system, as shown in Table 1.

TABLE I
BOOLEAN REPRESENTATION OF SOFT SET (F, E)

U/E	e_1	e_2	e_3	e_4	e_5
c_1	0	1	0	1	1
c_2	1	0	0	0	0
c_3	0	1	1	1	0
c_4	1	0	1	0	0
c_5	0	0	1	1	0
c_6	0	0	0	0	1

For modeling Alliance, Neutral, and Conflict situations in the information system, at least two conflicting parties, are named agents, as illustrated in Table 2.

TABLE II
TABULAR REPRESENTATION OF SOFT SET (F, E)

U/E	e_1	e_2	...	e_n
u_1	$F(e_1, u_1)$	$F(e_2, u_1)$...	$F(e_n, u_1)$
u_2	$F(e_1, u_2)$	$F(e_2, u_2)$...	$F(e_n, u_2)$
...
u_m	$F(e_1, u_m)$	$F(e_2, u_m)$...	$F(e_n, u_m)$

A conflict information system, as in Table 2, shows a table of rows, which are considered by objects (agents), columns-by characteristics (issues), and entries of the table are values of characteristics (opinions, beliefs, views, votes, etc.). The values are exclusively assigned to each agent, and a characteristic, i.e., each entry corresponding to row x and column a symbolizes the opinion of agent x about the issue a .

Description 2: (Alliance) Let (F, E) be multi-soft sets representing a conflict table, two agents $x, y \in U$, and $e \in E$. The alliance between x and y if and only if,

$$F_E(x, y) = 1, \text{ where } F_e(x, y) = 1 \text{ for } F(e, x)F(e, y) = 1 \text{ or } x = y \quad (1)$$

This means for $F_e(x, y) = 1$, agent x and agent y have the same view about issue e (associated).

Description 3: (Neutral) Let (F, E) be multi-soft sets representing a conflict table, two agents $x, y \in U$, and $e \in E$. The neutrality between x and y if and only if,

$$F_E(x, y) = 0, \text{ where } F_e(x, y) = 0 \text{ for } F(e, x)F(e, y) = 0 \text{ or } x \neq y \quad (2)$$

This means for $F_e(x, y) = 1$, agent x and agent y have the same view about issue e ($x, y = 1$, at least one agent x or y has neutral view about issue e (neutral).

Description 4: (Conflict) Let (F, E) be multi-soft sets representing a conflict table, two agents $x, y \in U$, and $e \in E$. The neutrality between x and y if and only if,

$$F_E(x, y) = 0, \text{ where } F_e(x, y) = -1 \text{ for } F(e, x)F(e, y) = -1 \text{ or } x = \neg y \quad (3)$$

This means for $F_e(x, y) = 1$, agent x and agent y have the same view about issue e (conflict).

B. Soft Set Conflict Algorithm

1) Matrix Discernibility among Agents

Let (F, E) be multi-soft sets representing a conflict table. By a discernibility matrix of D in $D \in E$, denoted $M(D)$ is an $m \times n$ sized matrix, where $n = |U|$ and defined as,

$$e(x, y) = \{d \in D_d / = d(y)\} \quad (4)$$

This entry of matrix $M(D)$, i.e., is the set of all attributes which discern agents x and y . Any entry of the matrix corresponding to agents x and y provides for those degrees of conflict between agents x and y .

2) Conflict Functions

We will additionally require the assessment of views between two agents x and y with admiration to the situated from claiming issues DE . To this end, we characterize a work known $\rho D(x, y)$ as a clash intersection defined as follows,

$$\rho D(x, y) = \frac{|\delta_D(x, y)|}{|D|} \quad (5)$$

Clearly, $0 \leq \rho D(x, y) \leq 1$. If $\rho D(x, y) = 0$, we will say that x and y are clinched alongside clash in D in a degree $\rho D(x, y)$, and obviously, if $\rho D(x, y) = 0$, x and y are in coalition over D .

3) Degree of conflict

Let (F, E) be multi-soft sets representing a conflict table and $D \in E$. As opposed to function ρ , we can define function ρ^* , which characterizes separation between agents more accurately by accepting that separation between agents continuously. Previously, the conflict will be more terrific over the separation between agents which need aid unbiased, whereby,

$$\rho_D^*(x, y) = \frac{\sum_{d \in D} \phi_D^*(x, y)}{|B|} \quad (6)$$

where,

$$\emptyset_D^*(x, y) = \frac{1 - \emptyset_d(x, y)}{2} = \begin{cases} 0 & \text{if } d(x)d(y) = 1 \\ 0.5 & \text{if } d(x)d(y) = 1 \\ 1 & \text{if } d(x)d(y) = -1 \end{cases} \quad (7)$$

The $\rho(x, y)$ will be called a degree of conflict between x and y . A pair (x, y) is said to be,

- Allied, if $\rho(x, y) < 0.5$
- Conflict, if $\rho(x, y) > 0.5$
- Neutral, if $\rho(x, y) = 0$

Finally, we derive an algorithm for handling conflict based on the soft set approach as shown in Algorithm 1.

Algorithm 1: Soft set for handling conflict

Input Conflict data

Output Conflict Graph

1. Compute multi-soft sets representing a conflict table
 2. Compute alliance between two agents in multi-soft sets
 3. Compute neutrality between two agents in multi-soft sets
 4. Compute conflict between two agents in multi-soft sets
 5. Draw conflict
 6. Compute the Matrix Discernibility among Agents
 7. Compute the Conflict Function
 8. Compute the degree of conflict or distance function
 9. Give the recommendation
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Based on Algorithm 1, the soft set approach begins by inputting conflict data, and then the data is converted to multi soft sets. Then the following steps are computing alliance, neutrality, and conflict based on multi soft-sets. Finally, the algorithm stops by drawing a conflict graph and decision-making.

C. Problems in the Indonesian Super League

The history of Indonesian football began with establishing the Football Association of Indonesia (PSSI) in Yogyakarta on April 19, 1930, under Soeratin Sosrosoegondo. PSSI joined FIFA in 1952, followed by AFC in 1954. PSSI has held a "Indonesia League" competition every year since 2005 and the Indonesian Cup. La Nyalla Mattalitti has chaired PSSI since April 18, 2015. Beginning in 2008, PSSI is made up of five levels of national football leagues: Top Tier Pro (Indonesia Super League), Second Tier Pro, First Tier Amateur, Second Tier Amateur, and Third Tier Amateur. There are other football competitions on the national level, namely the National Youth League (U-15), Indonesian Women Football Tournament, Indonesian National Futsal League, and Indonesia Super League U-21, which are held in similar appreciation to the ISL. Furthermore, each regional level (and lower) football association in the country has its own annual amateur football competition structure involving local clubs.

PSSI consists of three independent associations; the National Football Player Association of Indonesia (APSNI), the Football Coach Association of Indonesia (APSI), and the Indonesian Futsal Club Association (AKFI). PSSI has four organizations in its organizational structure; the Liga Indonesia Inc. (or PT. Liga Indonesia in Indonesian), which is responsible for the super league and premier division; the Board for Amateur Leagues (BLAI) for the first, second, and third divisions; Board for National Team (BTN) for national teams, and Board for Futsal National Team (BFN) for national futsal teams. On May 30, 2015, FIFA imposed official

sanctions on Indonesia, prohibiting all participation in international tournaments except for SEA games. This sanction also suspends FIFA and AFC from assisting PSSI in the form of funds, programs, education, and training courses, up until the fulfillment of the requirements given by FIFA. The requirements by FIFA are as follows:

- The Executive Committee of the Football Association of Indonesia (PSSI) remobilizes Indonesian football independently without any intervention from other parties, including the ministries or agencies.
- Management of the national team is returned to the PSSI entirely. Responsibility for the entire competition is given to the authority of PSSI and its bureaus.
- All clubs that obtain a license in agreement with the PSSI's Club Licensing Regulation must compete in the competition of PSSI.

D. Chronology of Conflicts

Several agencies were involved in this Indonesia super league conflict, including PSSI, the Ministry of Youth and Sports of Indonesia, Commission 10 of Parliament of Indonesia, and FIFA. The chronology of conflict is illustrated as follows.

- January 2, 2015: Team 9 of the Ministry of Youth and Sports of Indonesia was officially announced. This team has an obligation to observe and evaluate the performance of PSSI. Team 9 is populated by Imam B. Prasojo (sociologist), Budiarto Shambazy (journalist), Ricky Yakobi (Former National Team Player), Gatot S Dewabroto (Deputy V of the Ministry of Youth and Sports of Indonesia), Prof. Nurhasan (academician), Joko Susilo (former Indonesian Ambassador for Swiss), Eko Ciptadi (former corruption eradication commission), Yunus Husen (Indonesian Financial Transaction Reports and Analysis Center/INTRAC), Oegroseno (former vice president of the Indonesian National Police). Meanwhile, the PSSI headquarters can be occupied after being renovated. According to Djohar Arifin Husin, the fund spent was nearly 13 billion.
- January 4, 2015: PSSI opened its annual congress in 2015 at Borobudur Hotel, Jakarta. This congress presented the performance report for 2014 and design activities for 2015. However, the congress is enlivened by the refusal of PSSI towards ideas from Team 9 of the Ministry of Youth and Sports of Indonesia. One hundred seven members attended the congress was attended by 107 members including the Chairman of Commission 10 of Parliament of Indonesia, Teuku Riefky Harsya. He deplored the step of Imam Nahrawi (Minister of Youth and Sports of Indonesia), who composed Team 9. Imam Nahrawi did not attend the congress due to a hectic schedule. One of the critical decisions in the annual congress 2015 was the establishment of the Extraordinary Congress scheduled to be set on April 18 in Surabaya. In addition, PSSI formed Team Synergy to accommodate Indonesian football stakeholders' inputs.
- January 5, 2015: PSSI declared the vote of distrust to Imam Nahrawi. There were 6 points on the vote. Essentially, PSSI did not want any intervention from

the Ministry of Youth and Sports of Indonesia and begged Indonesian President Joko Widodo to act.

- January 12, 2015: Persik Kediri and Persiwawamena were fired from the participants in the Indonesia Super League. PT Liga Indonesia ensured both teams did not fulfill the financial aspect and made the Indonesia Super League followed by 18 teams only. The change of the number of participants resulted in the postponement of PT Liga Indonesia, the first kick-off Indonesia Super League.
- January 14, 2015: PSSI announced Team Synergy, which consisted of Mafudin Nigara (former journalist), Tjipta Lesmana (political observer), Ian Situmorang (former journalist), Fritz Simanjuntak (sociologist), Togar Manahan Nero (former chairman of the Disciplinary Commission), SuryoPratomo (journalist) Effendi Ghazali (political observer), GustiRanda (Chairman of PSSI Association of Jakarta), Ruddy Keljtes (former coach of U-19 National Team B), Rahim Sukasah (former National Team manager), Tri Goestoro (former general secretary of PSSI), and Hince Panjaitan (Chairman of Disciplinary Commission).
- January 15, 2015: PSSI met a demand of the invitation from the Commission 10 of Parliament of Indonesia. In the meeting, PSSI complained regarding the existence of Team 9, and Commission 10 of Parliament of Indonesia gave a positive signal to PSSI regarding refusal towards interference of the Ministry of Youth and Sports of Indonesia.
- January 28, 2015: The Ministry of Youth and Sports of Indonesia met PSSI by visiting the headquarters of PSSI. During the meeting, Gatot A. Dewa Broto, a spokesman, said that PSSI was unnecessary to worry because the Ministry of Youth and Sports of Indonesia never intended to freeze PSSI.
- February 13, 2015: Team 9 asked the Ministry of Youth and Sports of Indonesia not to recommend the Indonesia Super League Event 2015 or postpone it until the problems found by the Professional Sports Agency of Indonesia (BOPI) and Team 9 are resolved. These include the arrears of taxes, salary, inadequate facilities, early Childhood Development Issues, and team legality.
- February 14, 2015: Despite prohibition by BOPI, PT Liga Indonesia continued to launch Indonesia Super League 2015.
- February 16, 2015: The participants of the Indonesia Super League organized an emergency meeting because BOPI did not give a recommendation. During the meeting, the plan for kick-off on February 20 was confirmed unchanged. Clubs agreed to complete the requested aspects of BOPI while running the competition. However, the short time frame was considered insufficient to complete all requirements of BOPI due to bureaucracy.
- February 18, 2015: The delay of the Indonesia Super League event by BOPI and the Ministry of Youth and Sports of Indonesia forced PSSI to complain to FIFA. Imam Nahrawi asked PT Liga Indonesia to delay kick-off at least two weeks later, which was considered unlikely because it would affect the timetable that had been drawn up. The competition schedule would automatically affect the preparation of the U-23 National Team (which will face SEA Games 2015) and seniors. PSSI was eventually delaying the arrival of a foreign coach for the senior national team.
- February 20, 2015: 18 Clubs eventually judged and declared the attitude of it, including ignoring BOPI and the Ministry of Youth and Sports of Indonesia. FIFA already found out about this conflict and began commemorating PSSI of the risk suspension.
- February 23, 2015: Imam Nahrawi's decision to postpone ISL made 18 clubs complain to the Commission 10 of the Parliament of Indonesia. Fahri Hamzah, the vice-chairman of the Parliament of Indonesia, listened to the complaints from the delegation of the clubs and positively supported ISL to continue.
- February 24, 2015: PSSI and BOPI approved that ISL could be rolled on April 4, 2015. The Ministry of Youth and Sports of Indonesia was fast to respond, restating that the club's requisite aspect must be completed while the competition took place.
- March 19, 2015: PSSI received a letter from the Indonesian National Sports Committee that essentially supported and recommended that ISL 2015 can be progressed on schedule. But then, the letter was not recognized by the Ministry of Youth and Sports of Indonesia regarding its validity.
- March 26, 2015: Imam Nahrawi asked Extraordinary Congress (KLB) in 2015 to be delayed until the 2015 SEA Games in Singapore were completed. The pretext was in order to Indonesia got an achievement in Singapore. KLB itself is planned to be held in Surabaya on April 18. PSSI considered the reason as something silly. At the same time, BOPI promised to publish a recommendation that ISL could be rolling on April 28 or one week before kick-off.
- April 4, 2015: Kick-off Indonesian Super League (ISL) in 2015 was finally realized with a number of games played on that day.
- April 18, 2015: Extraordinary Congress (KLB) in 2015 was finally realized in Surabaya. La Nyalla Mahmud Mattalitti was elected as the Chairman of PSSI period of 2015-2019. However, when KLB was still ongoing, the Ministry of Youth and Sports of Indonesia suddenly sent a letter regarding suspension to PSSI and refused to acknowledge the result of KLB. Strangely, the letter was dated April 17.
- April 22, 2015: PSSI made an effort to make peace with the Ministry of Youth and Sports of Indonesia and revoke the freezing letter. However, it did not work, and finally, PSSI was officially judged through the State Administrative Court by the Ministry of Youth and Sports of Indonesia.
- April 27, 2015: The Ministry of Youth and Sports of Indonesia moved on with the intention to supervise the competition in Indonesia. Imam Nahrawi held a meeting with 18 clubs of ISL. The results, they wanted ISL to proceed, but without PSSI because they had been frozen.
- May 2, 2015: A number of ISL matches did not achieve security clearance from the police regarding the

freezing letter by the Ministry of Youth and Sports of Indonesia. It made the ISL deemed impossible to run, so the Executive Committee of PSSI took steps to stop the competition for force majeure.

- May 15, 2015: PT Liga Indonesia held a general meeting of shareholders in Jakarta. One of the results of the meeting was to organize a pre-season tournament from May to August. Then, PT Liga Indonesia had a plan to launch the ISL 2015/16 season in August 2015 until April 2016.
- May 25, 2015: PSSI's lawsuit to the State Administrative Court concerning the freezing letter of the Ministry of Youth and Sports of Indonesia was granted. The freezing letter was declared inactive until a further decision of the trial.
- May 30, 2015: FIFA officially suspended Indonesia due to government intervention, The Ministry of Youth and Sports of Indonesia. The sanctions will be held until an unspecified time, in which FIFA wants conducive conditions for Indonesian football without government intervention.
- June 7, 2015: Indonesia was ostracized from the international event due to sanctions by FIFA.
- June 10, 2015: Commission 10 of Parliament of Indonesia asked Imam Nahrawi to have a meeting with PSSI no later than June 23, 2015.
- June 17, 2015: Indonesia dropped out of the AFF Cup U-16 and U-19 despite Indonesia being the host of that event. That case was not separated from FIFA's sanctions on Indonesia.
- June 23, 2015: The Ministry of Youth and Sports of Indonesia carried out the request of Commission 10 of Parliament of Indonesia with a little modification. They met PSSI but only invited Djohar Arifin Husin, who had no position in the PSSI because La Nyalla Mattalitti had replaced him, according to the results of KLB 2015. The meeting had no concrete results.
- June 25, 2015: All national football figures declared attitudes related to the current condition of Indonesian football. One of them asked Joko Widodo (the President of Indonesia) to fix the conflict and sought to revoke FIFA sanctions.
- July 14, 2015: PSSI won an accusation in the National Administrative Court against the Ministry of Youth and Sports of Indonesia. The ministry planned to appeal and extend the conflict as well. In comparison, PSSI had confirmed that it was ready to run the competition.
- July 27, 2015: Resistance towards the Ministry of Youth and Sports of Indonesia who froze PSSI went bigger and bigger. The number of football actors characterized it complained to the National Commission for Human Rights of Indonesia. Several actors complained among coaches, traders even the referees.
- July 29, 2015: PT Liga Indonesia established that ISL would be held in the third week of October 2015 based on the National Administrative Court decision. PSSI won the claim and was freed from the freezing Letter of the Ministry of Youth and Sports of Indonesia.
- August 3, 2015: Through the Executive Committee meeting, PSSI established that ISL would be back to roll on the third week of October 2015. In addition, PSSI had the initiative to hold a corruption eradication commission and police allegation of match-fixing that affected Indonesia at the SEA games 2015.
- August 4, 2015: The desire of PSSI to roll the competition in October was rejected by the Ministry of Youth and Sports of Indonesia and BOPI due to their statement that the freezing letter had not been revoked.
- August 6, 2015: The Ministry of Youth and Sports of Indonesia immediately sent a letter to the police to prohibit all activities under PSSI, including competition.
- August 15, 2015: The Ministry of Youth and Sports of Indonesia celebrated; they held the Independence Cup tournament, followed by the majority of the club's Premier Division. The opening match was held at the Stadium Maulana Yusuf, Serang. President Joko Widodo gave a speech and supported the tournament.
- August 30, 2015: President Cup was officially opened in Bali with the opening match between Bali United vs. Persija Jakarta. The match was held at the Stadium Captain Wayan Dipta. President Jokowi, La Nyalla Mattalitti and Imam Nahrawi were present.
- September 2, 2015: PT Liga Indonesia re-announced the delay of ISL 2015/16. It was after the police permission was not available up to August 30, 2015. The delay of ISL also affected other competitions.
- September 15, 2015: Eventually, PSSI did not choose to provide a recommendation for the event of ISL. The decision was made during the meeting of Executive Committee, where PSSI preferred to take place when PSSI had not been frozen and waited for the decision of the National Administrative Court.
- September 25, 2015: PSSI publicized that FIFA and AFC will send a delegation to Indonesia to solve the problem of football. Their arrival was expected to put an end to the suspension of FIFA to Indonesia. The delegation will also meet all relevant parties, including President Joko Widodo.
- October 5, 2015: The conflict between PSSI and the Ministry of Youth and Sports of Indonesia was not only interfering with the professional competition but also interfered with the Pre-National Sports Week (PON) event. As a result, Pre-PON was also delayed until an unspecified time.
- October 25, 2015: PT Liga Indonesia held a general shareholders meeting in Jakarta. They complained about the financial losses resulting from the vacuum competition. Finally, with the blessing of PSSI, PT Liga had a long-term independent tournament plan in 2016.
- October 26, 2015: The tournament was held again to keep the pulse of Indonesian football. This time, it was the Indonesian National Army (TNI) who wanted to have a celebration by inviting 14 teams of ISL. TNI merged PSMS Medan and appeared as PS TNI.
- November 2, 2015: Finally, FIFA and AFC delegations came to Indonesia. They were KphzoTashima (FIFA), H.R.H. Prince Abdullah (FIFA), Mariano V Araneta (AFC), James Johnson (AFC), Sanjeevan (AFC), and John Windsor (AFC). FIFA deep-rooted the importance of the government to cooperate and respect FIFA Statues so that the suspension to Indonesia could be

lifted immediately. On that occasion, the delegation of FIFA listened to all government statements without a single delegation of the PSSI. The government also claimed that FIFA agreed that the government should create a mediation team of Indonesia with FIFA without the delegation of the PSSI.

- November 3, 2015: FIFA was disappointed with the government's statement that they agreed to the creation of a team without involving representatives of PSSI. Even FIFA blamed that the media had misinterpreted their statements related to it. FIFA was finally willing to give a press conference by John Windsor and agreed to establish an Ad-Hoc Committee Teams to attend to all the elements relevant to Indonesian football.
- November 5, 2015: PSSI received a letter containing an appeal victory over the Ministry of Youth and Sports of Indonesia from the National State Administrative High Court (PTTUN) Jakarta. The verdict has been issued PTTUN since October 28, 2015.
- November 14, 2015: The Government insisted that they would not send a delegation to the Ad-Hoc Committee on the reform of Indonesian football. The government was determined to establish a small team inhabited by only five people.
- November 23, 2015: PSSI tried to apply to be the host of the 2023 Asian Cup, and the secretary-general of Azwan Karim confirmed it. Meanwhile, Indonesia Futsal Association (AFI) officially changed its name to the Indonesian Futsal Federation (FFI).
- December 3, 2015: Finally, FIFA inaugurated the Ad-Hoc Committee for the reformation of Indonesian football. It was decided at the executive committee meeting in Zurich, Switzerland.
- December 4, 2015: Small team of government ideas was established. They were Makarim Wibisono (former Indonesian ambassador to the United Nations), Dede Sulaiman (former national team player of Indonesia), Djoko Susilo (members of the Transition Team and a former Indonesian ambassador to Switzerland), Rita Subowo (former chairman of Sports Committee of Indonesia (KOI)), and Gatot S. Dewa Broto (Deputy V of Harmonization and Partnership agency of the Ministry of Youth and Sports of Indonesia).
- December 7, 2015: The composition of the personnel of the Ad-Hoc Committee has been officially announced by Agum Gumelar as Chairman and IGK Manila as vice chairman. They included Tommy Welly (PSSI), Bambang Pamungkas (APPI), Joko Driyono (competition), Monica Desideria (women's football), Mahfudin Nigara (KONI), minus KOI, and the government delegation who were undecided. Through the Ministry of Youth and Sports of Indonesia, the government declared five statements in response to Ad-Hoc Committee. In essence, the government felt that FIFA had violated its promise cornered and assessed.
- December 9, 2015: Pieter Huistra officially abandoned his position as technical director of PSSI due to frustration over the conditions of Indonesian football as he could not do his job with the maximum result.
- December 11, 2015: Ad-Hoc Committee held the first meeting at the head office of PSSI. APPI and

government delegation did not attend, while KOI established Raja Pane as their delegation. The AFC delegation, Mariano Araneta monitored this meeting.

- December 22, 2015: Ad-Hoc Committee held a second meeting. The delegation of APPI was absent, and the government was consistent in not sending their delegation. Agum Gumelar also confirmed that he had difficulty communicating with Imam Nahrawi.

E. Conflicting Agencies and Governing Parties

From the chronology of conflicts described in the previous section, there are six agents affected by Indonesian football, including the Football Association of Indonesia (PSSI), the Indonesian National Sports Committee (KONI), the Ministry of Sport and Youth of Indonesia, Parliament 10 of Indonesia, the Federation Internationale de Football Association (FIFA), and the Indonesian President himself. Meanwhile, there are six attributes (issues) related to the conflict situation, listed as follows:

- Early childhood development issues among clubs in the Indonesian Super League
- Tax arrears of Indonesia Super League Clubs social activities of Indonesia Super League Clubs
- The legality of Indonesia Super League Clubs that have not been reported Government intervention (The Ministry of Youth and Sports) towards PSSI
- The Minister of Youth and Sports of Indonesia does not support and does not contribute positively to the advancement of the national football

The relation between the above issues and agents is as follows.

1) Football Association of Indonesia (PSSI)

- (PSSI/a) PSSI did not recognize the existence of problems in early childhood development because each participant of the Indonesia Super League club has coaching programs such as U12, U14, U16, and U18, who competed in the Suratin league, Nusantara league, and Indonesia Super League U21.
- (PSSI/b) PSSI justified that some Indonesian Super League Clubs still have issues in tax arrears.
- (PSSI/c) PSSI dismissed that there were problems with social activity programs of Indonesian Super League clubs because this program can be implemented when the competition takes place without delaying the competition.
- (PSSI/d) PSSI disagreed on the legality problem in several clubs of the Indonesia Super League because the problem can be solved even when competition is running.
- (PSSI/e) PSSI considered the government (the Ministry of Youth and Sports) to intervene too much in PSSI.
- (PSSI/f) PSSI agreed that the Minister of the Youth and Sports of Indonesia (Imam Nahrawi) did not contribute positively and did not support the advancement of national football.

2) Indonesian National Sports Committee (KONI)

- (KONI/a) KONI was to be neutral to the fact that there were problems regarding early childhood development within PSSI and clubs of the Indonesia Super League.

- (KONI/b) KONI acknowledged problems of tax arrears for some Indonesia Super League clubs.
 - (KONI/c) KONI did not admit to issues of social activities in clubs of Indonesia Super League and approved the roll-out of Indonesia Super League despite the conflict.
 - (KONI/d) KONI acknowledged the legality problems of some clubs that will compete in the Indonesia Super League.
 - (KONI/e) KONI was to be neutral to the fact that the government intervened PSSI.
 - (KONI/f) KONI did not admit that Imam Nahrawi did not support and did not contribute positively to the progress of national football.
- 3) *Ministry of Youth and Sports of Indonesia*
- (Ministry/a): The ministry, through BOPI (Professional Sport Agency of Indonesia), acknowledged and proved that there were problems in early childhood development programs in some of the participating clubs of the Indonesia Super League.
 - (Ministry/b): The ministry, through BOPI (Professional Sports Agency of Indonesia), confirmed the existence of several clubs in the Indonesia Super League that have not completed tax issues.
 - (Ministry/c): The ministry, through BOPI (Professional Sports Agency of Indonesia), recognized and proved there are problems in the program of social activities at several clubs Indonesia Super League.
 - (Ministry/d): The ministry, through BOPI (Professional Sports Agency of Indonesia), found that some clubs have not completed the Indonesia Super League documents as a condition of the legality.
 - (Ministry/e): The ministry did not admit that it intervened in PSSI but only exercised its duty to ensure an orderly and professional competition.
 - (Ministry/f): The ministry, through BOPI (Professional Sports Agency of Indonesia), did not admit that Imam Nahrawi did not support and did not contribute positively to the progress of national football.
- 4) *Commission 10 of Parliament of Indonesia*
- (Parliament/a): Commission 10 of Parliament of Indonesia did not recognize the early childhood development problems of Indonesia Super League clubs. Therefore, they insisted it supports the Indonesia Super League held as scheduled without caring recommendations from the Ministry of Youth and Sports of Indonesia through BOPI (Professional Sports Agency of Indonesia).
 - (Parliament/b): Commission 10 of the Parliament of Indonesia did not recognize the problems of the tax arrears of some Indonesia Super League clubs; therefore, Commission 10 of Parliament of Indonesia asked Indonesia Super League still be held as scheduled and denounced the Ministry of Youth and Sports of Indonesia.
 - (Parliament/c): Commission 10 of the Parliament of Indonesia did not recognize the problems of social activity programs of Indonesia Super League clubs. Therefore, Commission 10 of the Parliament of Indonesia supported Indonesia Super League was held according to the schedule.
 - (Parliament/d): Commission 10 of the Parliament of Indonesia did not recognize the legality problem of the clubs that will compete in the Indonesia Super League because Commission 10 of Parliament of Indonesia believed that Indonesia Super League clubs are professional and legal as set by the law.
 - (Parliament/e): Commission 10 of Parliament of Indonesia recognized the government's intervention (the Ministry of Youth and Sports of Indonesia through BOPI) towards PSSI regarding the Indonesia Super League Event.
 - (Parliament/f): Commission 10 of Parliament of Indonesia was to be neutral on the issue of PSSI, considering that the Minister of Youth and Sports of Indonesia did not support and did not contribute positively to the progress of national football.
- 5) *FIFA*
- (FIFA/a): FIFA acknowledged that there were problems regarding early childhood development at the PSSI and clubs of the Indonesia Super League. Therefore, early childhood development was one of the discussions in UEFA's cooperation with PSSI.
 - (FIFA/b): FIFA acknowledged problems of tax arrears some Indonesia Super League clubs. Therefore, FIFA required that all of its members comply with the payment of taxes in each country because professional clubs have to pay taxes.
 - (FIFA/c): FIFA was to be neutral on social activities issues in Indonesia Super League clubs and approved Indonesia Super League to be rolled despite the conflicts.
 - (FIFA/d): FIFA acknowledged problems with the legality of some clubs competing in the Indonesia Super League. Therefore, PSSI was reminded that every federation of FIFA members must deal with the problems they face independently and was not under the influence of any third party as stated in articles 13 and 17 of FIFA statutes.
 - (FIFA/e): FIFA acknowledged the government's intervention (the Ministry of Youth and Sports of Indonesia through BOPI) regarding the Indonesia Super League event of PSSI.
 - (FIFA/f): FIFA was to be neutral on the problem that PSSI considers the Minister of Youth and Sports of Indonesia did not support and did not contribute positively to the progress of the national football.
- 6) *Indonesian President*
- (Indonesian President/a): The Indonesian President acknowledged that there were problems regarding early childhood development at the PSSI and clubs of the Indonesia Super League.
 - (Indonesian President/b): Indonesian President was to be neutral on the problem of tax arrears among some Indonesia Super League clubs.
 - (Indonesian President/c): Indonesian President was to be neutral on issues of social activities in clubs of Indonesia Super League and approved Indonesia Super League rolled though there are a few other issues.

- (Indonesian President/d): Indonesian President was to be neutral on the legality problems of some clubs competing in the Indonesia Super League.
- (Indonesian President/e): The Indonesian President did not admit that the government intervened PSSI.
- (Indonesian President/f): The Indonesian President did not admit that Imam Nahrawi did not support/contribute positively towards the progress of national football.

F. Conflict Table and Graphs

The relationships of each agent to an explicit issue are described in Table 3.

TABLE III
INDONESIAN FOOTBALL CONFLICT SITUATION

U/A	a	b	c	d	e	f
PSSI (1)	-	+	-	-	+	+
Ministry (2)	+	+	+	+	-	-
Parliament (3)	-	-	-	-	+	+
FIFA (4)	+	+	0	+	+	0
Indonesian President (5)	+	0	0	0	-	-
Indonesian National Sports Committee (6)	0	+	+	+	0	-

In the table, for the sake of simplicity, we write - and + instead of -1 and 1, respectively. The attitudes of the six agents of the football game to the above issues are represented as -1 means (the agent is against or in conflict), 1 (the agent is favorable or in alliance), and 0 (the agent is neutral towards the issue).

Each table row exclusively symbolizes an agent and his stand on the contradicted issues. In conflict analysis, we are concerned with discovering the relationship between agents taking part in the dispute and exploring what can be done to develop the relationship between agents to resolve the conflict. From this table, we have identified that the objects (agents) are the Club Managements, Match Inspector, Referee, Organizing Committee, Supporter, and Player. Meanwhile, the characteristics (issues) include players' unsupportive behavior, fans' riot, lack of appropriate facilities and infrastructure, unfair referees, and management of the amateur competition. The values of characteristics represent the opinions of each agent on each issue, as shown in Eq. 8. The equation shows that all values for each attribute or issue have the same characteristics, i.e. $\{-, 0, +\}$.

$$Va = Vb = Vc = Vd = Ve = \{-, 0, +\} \quad (8)$$

III. RESULTS AND DISCUSSION

Based on the Indonesian football conflict case study, this section will present the resulting soft set in handling conflict.

A. Alliance, Neutral, and Conflict

The information on each agent's methods, to the extent of issues being well thought-out in the argument, is essential to conflict analysis. In this work, relationships between the agents are described in three basic binary relatives of universal conflict, neutrality, and alliance. From Table 3, let there be two agents x , i.e., FIFA and y , i.e., the Indonesian President, then,

$$\alpha_a(x) = \alpha_a(\text{FIFA}) = 1 \text{ and} \quad (9)$$

$$\alpha_a(y) = \alpha_a(\text{Indonesian President}) = 1$$

$$\alpha_a(x, y) = \alpha_a(\text{FIFA, Indonesian President}) = 1 \quad (10)$$

Therefore, FIFA and the Indonesian President are in alliance for the early childhood development Issues in Indonesia Super League. Another example of the alliance is between match inspector and supporter on issue c , then,

$$\alpha_c(x) = \alpha_c(\text{PSSI}) = -1 \text{ and} \quad (11)$$

$$\alpha_c(y) = \alpha_c(\text{Parliament}) = -1$$

$$\alpha_c(x, y) = \alpha_c(\text{PSSI, Parliament}) = 1 \quad (12)$$

Therefore, PSSI and Parliament are in alliance for the social activities issues in Indonesia Super League. Next example, where there are two agents on issue c , then,

$$\alpha_c(x) = \alpha_c(\text{FIFA}) = 1 \text{ and} \quad (13)$$

$$\alpha_c(y) = \alpha_c(\text{Indonesian President}) = 0$$

$$\alpha_c(x, y) = \alpha_c(\text{FIFA, Indonesian President}) = 1 \quad (14)$$

Therefore, FIFA and the Indonesian President are in alliance for the social activities issues in Indonesia Super League. Next, from Table 3, let there be two agents x , i.e., the Indonesian President, and y , i.e., KONI, then,

$$\alpha_c(x) = \alpha_c(\text{Indonesian President}) = 0 \quad (15)$$

$$\alpha_c(y) = \alpha_c(\text{KONI}) = 1$$

$$\alpha_c(x, y) = \alpha_c(\text{Indonesian President, KONI}) = 0 \quad (16)$$

Therefore, the Indonesian President and KONI are in alliance for the social activities issues in Indonesia Super League. Finally, from Table 3, let there be two agents x , i.e., Ministry, and y , i.e., Parliament, then,

$$\alpha_c(x) = \alpha_c(\text{Ministry}) = 1 \quad (17)$$

$$\alpha_c(y) = \alpha_c(\text{Parliament}) = -1$$

$$\alpha_c(x, y) = \alpha_c(\text{Ministry, Parliament}) = -1 \quad (18)$$

Therefore, the Ministry and Parliament conflict on the issue of early childhood development in the Indonesia Super League (ISL). The conflict graphs on all issues on the Indonesian Super League are shown in Fig. 1 to Fig. 6.

From Fig. 1, we can see that KONI is to be neutral, whereas PSSI and Ministry, PSSI and Indonesian President, PSSI and FIFA, Parliament and Ministry, Parliament and FIFA, and Parliament and Indonesian President are in conflict about this issue. Therefore, agents who become alliance are PSSI and Parliament, Ministry and FIFA, Ministry and Indonesian President, FIFA and Indonesian President.

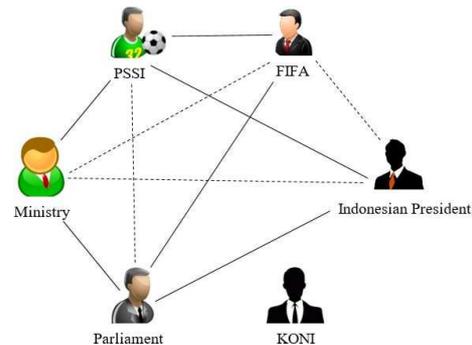


Fig. 1 Conflict graph on early childhood development issues in ISL

Next, Fig. 2 shows the conflict graph on tax arrears issues. In this figure, the agents' conflicts are Parliament and Ministry, Parliament and PSSI, Parliament and FIFA, and Parliament and KONI. Meanwhile, Ministry and PSSI, Ministry and FIFA, Ministry and KONI, PSSI and KONI, PSSI and FIFA, and FIFA and KONI are in alliance for this issue. Therefore, agents in conflict are Parliament and Ministry, Parliament and PSSI, Parliament and FIFA, and Parliament and KONI.

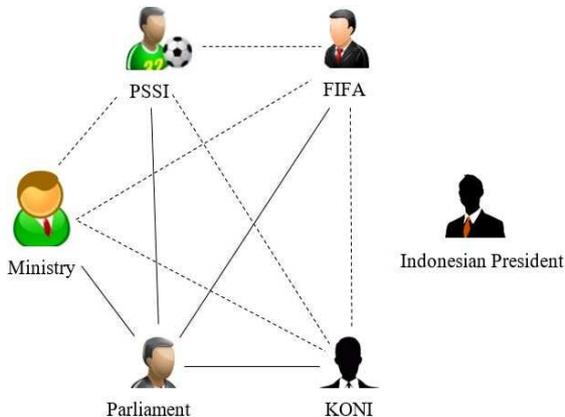


Fig. 2 Conflict graph on tax arrears issues in ISL

In Fig. 3, PSSI, Parliament, Ministry, and KONI are in alliance on the issue of social activities. However, PSSI and Ministry, PSSI and KONI, KONI and Parliament, and Parliament and Ministry conflict on this issue. Meanwhile, the Indonesian President and FIFA are in neutral.

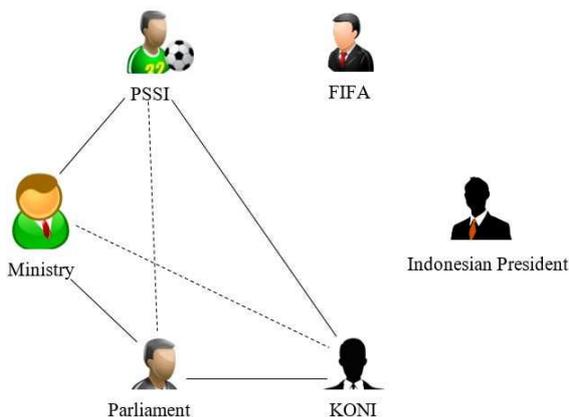


Fig. 3 Conflict graph on social activities issues in ISL

Fig. 4 shows that Parliament and Ministry, Parliament and KONI, Parliament and FIFA, PSSI and Ministry, PSSI and KONI, and PSSI and FIFA conflict with the issue of legality among Indonesia Super League clubs that have not been reported. However, Ministry and FIFA, Ministry and KONI, PSSI and Parliament, and FIFA and KONI are in the alliance about this issue. Meanwhile, the Indonesian President is neutral.

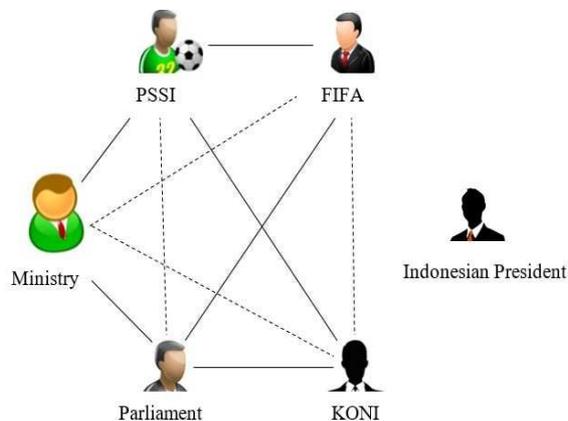


Fig. 4 Conflict graph on legality issues of ISL

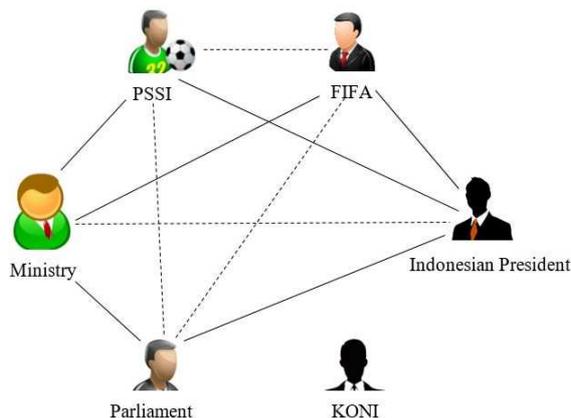


Fig. 5 Conflict graph on government intervention issues between Ministry and PSSI

Next, Fig. 5 shows that on the issue of government intervention towards PSSI; PSSI and FIFA, PSSI and Parliament, FIFA and Parliament, and Ministry and President are in alliance. However, Ministry and PSSI, Ministry and FIFA, Ministry and Parliament, President and FIFA, President and PSSI, and President and Parliament conflict with this issue. Meanwhile, KONI is neutral to this issue.

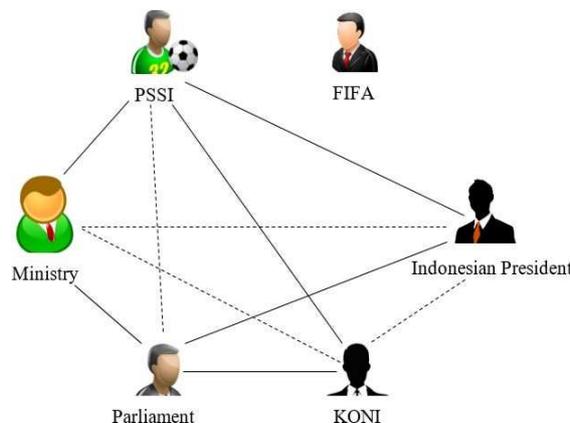


Fig. 6 Conflict graph on support and contribution issues by the ministry

TABLE IV
DISCERNIBILITY MATRIX FOR ISL CONFLICT

	PSSI	Ministry	Parliament	FIFA	President	KONI
PSSI	-	-	-	-	-	-
Ministry	<i>a,c,d,e,f</i>	-	-	-	-	-
Parliament	<i>b</i>	<i>a,b,c,d,e,f</i>	-	-	-	-
FIFA	<i>a,c,d,f</i>	<i>c,e,f</i>	<i>a,b,c,d,f</i>	-	-	-
President	<i>a,b,c,d,e,f</i>	<i>b,c,d</i>	<i>a,b,c,d,e,f</i>	<i>b,d,e,f</i>	-	-
KONI	<i>a,c,d,e,f</i>	<i>a,e</i>	<i>a,b,c,d,e,f</i>	<i>a,c,e,f</i>	<i>a,b,c,d,e</i>	-

TABLE V
CONFLICT FUNCTION FOR ISL

	PSSI	Ministry	Parliament	FIFA	President	KONI
PSSI	-	-	-	-	-	-
Ministry	0.83	-	-	-	-	-
Parliament	0.17	1.00	-	-	-	-
FIFA	0.83	0.50	0.83	-	-	-
President	1.00	0.50	1.00	0.67	-	-
KONI	0.83	0.33	1.00	0.67	0.83	-

TABLE VI
DISTANCE FUNCTION FOR ISL

	PSSI	Ministry	Parliament	FIFA	President	KONI
PSSI	-	-	-	-	-	-
Ministry	0.83	-	-	-	-	-
Parliament	0.17	1.00	-	-	-	-
FIFA	0.50	0.33	0.66	-	-	-
President	0.75	0.25	0.75	0.41	-	-
KONI	0.66	0.17	0.83	0.32	0.40	-

B. Dissimilarities between Agents

Given the conflicts illustrated in the previous section, we present different opinions among agents using a discernibility matrix as shown in Table 4, where each row represents issues for which the agents need distinctive suppositions. From the table, our concern is only the relationship between PSSI and the Indonesian President, Ministry and Parliament, Parliament and Indonesian President, and Parliament and KONI. These agents have different opinions on each issue, but PSSI and Parliament have just one different opinion on the issue of tax arrears. For example, we take PSSI as agent x and the Indonesian President as agent y on the issue on a . Hence, we have $|\delta_B(x, y)| = 6$ and $|B| = 6$. Therefore,

$$\rho_B(x, y) = \frac{6}{|6|} = 1 \quad (19)$$

C. Conflict Function

In this section, we present the conflict function for the Indonesia Super League. Those conflict function grid to clash introduced in Table 4 is provided in Table 5. Each row of the table exposes the value comparison to all issues for which those comparing agents need distinctive suppositions.

From Table 5, we can see the value comparison under Table 4. The highest conflict function with the value comparison of 1 occurs in the relationship of PSSI and Indonesian President, Ministry and Parliament, Parliament and Indonesian President, and Parliament and KONI. Meanwhile, the lowest conflict function of the value 0.17 occurs in the relationship between PSSI and Parliament.

For example, we have agent 3 (Parliament) and agent 4 (FIFA). Both agents are in conflict on the issue of a (early childhood development of Indonesia Super League) (-1). Both

agents are in conflict on the issue of b (tax arrears of Indonesia Super League clubs) (-1). Regarding c (social activities of Indonesia Super League clubs), both agents are neutral (0). Regarding d (legality of Indonesia Super League clubs that have not been reported), both agents are in conflict (-1). On the issue of e (government intervention (the Ministry of Youth and Sports of Indonesia) towards the Football Association of Indonesia (PSSI)), both agents are neutral (0). Finally, on the issue f (the Minister of Youth and Sports of Indonesia does not support or contribute positively to the advancement of national football), both agents are neutral (0).

Given the base equation of the conflict function, as shown in Eq. 20, we have the distance value using conflict functions as the following.

$$\rho\beta(x, y) = \frac{\sum \alpha\epsilon\beta\phi_\alpha^*(x, y)}{|\beta|} \quad (20)$$

1) On the issue a for agent 3 and agent 4,

$$\begin{aligned} \phi^{\alpha(3,4)} &= \frac{1 - \phi_\alpha(3,4)}{2} = \frac{1 - (-1)}{2} = 1 \\ \text{then } \rho_\beta^*(3,4) &= \frac{1}{|6|} = 0.17 \end{aligned} \quad (21)$$

2) On the issue b for agent 3 and agent 4,

$$\begin{aligned} \phi^{b(3,4)} &= \frac{1 - \phi_b(3,4)}{2} = \frac{1 - (-1)}{2} = 1 \\ \text{then } \rho_\beta^*(3,4) &= \frac{0.5}{|6|} = 0.08 \end{aligned} \quad (22)$$

3) On the issue c for agent 3 and agent 4,

$$\phi^{c(3,4)} = \frac{1 - \phi_c(3,4)}{2} = \frac{1 - 0}{2} = 0.5 \quad (23)$$

$$\text{then } \rho_{\beta}^*(3,4) = \frac{0.5}{|6|} = 0.08$$

4) On the issue *d* for agent 3 and agent 4,

$$\varnothing^{d(3,4)} = \frac{1 - \varnothing_{\alpha}(3,4)}{2} = \frac{1 - (-1)}{2} = 1$$

$$\text{then } \rho_{\beta}^*(3,4) = \frac{1}{|6|} = 0.17$$

5) On the issue *e* for agent 3 and agent 4,

$$\varnothing^{e(3,4)} = \frac{1 - \varnothing_{\alpha}(3,4)}{2} = \frac{1 - 1}{2} = 0$$

$$\text{then } \rho_{\beta}^*(3,4) = \frac{0}{|6|} = 0$$

6) On the issue *f* for agent 3 and agent 4,

$$\varnothing^{f(3,4)} = \frac{1 - \varnothing_{\alpha}(3,4)}{2} = \frac{1 - 0}{2} = 0.5$$

$$\text{then } \rho_{\beta}^*(3,4) = \frac{0.5}{|6|} = 0.08$$

D. Degree of Conflict or Distance Function

This section presents the degree of conflict or the distance function of the relationship of each agent. Those degrees of conflict or the distance function grid to the relationship of each agent to a specific issue introduced in Table 4 are provided in Table 6. Each row of the table exposes the distance of relationship of all issues. The distance values of agent 3 (Parliament) and agent 4 (FIFA) to all issues is $0.17 + 0.17 + 0.08 + 0.17 + 0 + 0.08 = 0.66$.

The table shows that the highest distance function with the value of 1 occurs in the relationship between Ministry and Parliament. Otherwise, the lowest distance function with the value of 0.17 occurs in the relationship of PSSI and Parliament and Ministry and KONI. Fig. 7 illustrates the distance functions presented in Table 6.

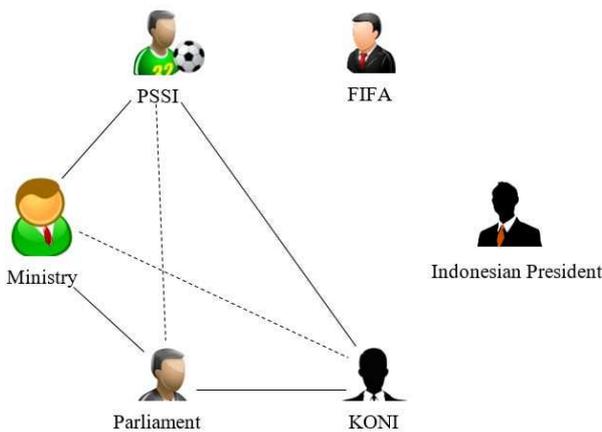


Fig. 7 Generalized conflict of Indonesia Super League

It is shown that the highest conflict in Indonesia Super League with the value of 1 is between the ministry and the Parliament. Meanwhile, there are seven pairs of agents with a value of less than 0.5, which means agents who are alliance include PSSI and Parliament, Ministry and FIFA, Ministry and Indonesian President, Ministry and KONI, FIFA and Indonesian President, FIFA, and KONI and Indonesian President and KONI. Whereas, there are also seven pairs of

an agent with a value of more than 0.5, which means agents are in conflicts such as PSSI and Ministry, PSSI and KONI, PSSI and Indonesian President, Parliament and FIFA, Parliament and Indonesian President, Parliament and KONI, and ministry and Parliament.

E. Discussion

In summary, four main conflicts need the most attention: a, b, d, and e; early childhood development issues, tax arrears, legality of the clubs, and government intervention. Given these findings, the analysis will focus on recommending the agents who are in conflict. Firstly, in the conflict between PSSI and Ministry, the value of the distance function showed that these agents have a value of 0.83, meaning there are five obvious different opinions. Although PSSI is an independent institution, PSSI must cooperate with the ministry to overcome the problems in the Indonesian Super League. These agents should focus on overcoming the problems rather than accusing or defending themselves.

Secondly, the conflict between PSSI and the Indonesian President has the value of distance function of 0.75, which means there are only three obvious different opinions between these agents, and the rest are neutral to the issues. PSSI must precisely consider the arising problems from the viewpoint of the President as the President would be deemed the wisest man in mediating the problems that occurred. Thirdly is the conflict between PSSI and KONI. The distance function showed the value of 0.66, which means these agents are slightly in conflict. KONI should be a good partner and supervisor for all agendas of PSSI, and they should overcome the problem that happens to be solved together.

Fourthly, in the conflict between Ministry and Parliament, the distance function showed that these agents have the value of 1, which means these agents are in the highest conflict. Ironically, these agents are the supervisor for the PSSI, and they should not be in conflict. They must work together to find a formula to be given to the PSSI to resolve the issue. Lastly, the conflict between Parliament and FIFA, Parliament and Indonesian President, and Parliament and KONI should not happen because the distance function shows that they are only in slight conflict. Parliament, FIFA, the Indonesian President, and KONI are in the same position as the ministry. They should become a partner and collaborate to solve the issue in Indonesia Super League.

To sum up, PSSI is an independent institution. No one can intervene in PSSI, but PSSI is the branch of FIFA, and PSSI exists in Indonesia. So, PSSI must be able to merge and harmonize the regulations of FIFA and Indonesia's government.

IV. CONCLUSIONS

It is well-known that conflict analysis has been used to handle problems in the military, politics, business, management, and urban planning. The analysis provides a solution to handle conflict situations among agents involved. Rough set theory, a mathematical approach in Computational Science, has been widely used for handling conflict situations. This paper presents a new view of handling conflict based on ideas drawn from a new mathematical model called the Soft Set theory. Based on the fact that every rough set is a soft set, we derived an alternative method to handle conflict from the

point of view of soft set theory. We then delineated the proposed method for an instructional example of a football conflict situation. Moreover, we have elucidated the proposed method on the real conflict situation of the Indonesia Football Super League. We have shown that the proposed method can be used to handle conflict and finally make a recommendation to the football agents involved.

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