

日本経営実務法学会

経営実務法研究
第17号 抜刷

The Reframing Detection Focused Attention on Topic Flow

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Abstract. Reframing is one mediation technique used in conciliation court. It requires an experienced conciliator to understand the claimers' confictions as well as their interests to implement it well. Since conciliation court is restricted from the public, and the tape of the narratives from claimers are hard to gain, it is hard for a lay person to grab the real situation in the court process and learn when and how to use the reframing method; therefore a computer assisted reframing training program is desperately needed. I have been conducting a collaborative research with Professor Katsumi NITTA² at the Interdisciplinary Graduate School of Science and Engineering, Tokyo Institute of Technology. To solve this problem, we focused attention on topic flow. In this process, we performed some mock conciliations to accumulate data for analysis. We paid our attention to seven kinds of reframing by Hall and Bodenhamer. This enables our system to detect and output a point and classification of the reframing with the help of computer software. When a user inputs argument log and does tagging on it, the system outputs a point and classification of reframing. The system will narrow down "Transition Pattern Filter of Utterance Role" and "Pattern Filter of Argument Structure & Issue Transition", and finally detect and output a point and classification of reframing. We used two analytical tools. The first tool mounts an editor building "Toulmin's Diagram" expressing logical structure of arguments to detect the reframing. The second tool analyzes the structure of character data of mock conciliation using "KeyGraph", which characterizes reframing as topic shift and visualizes, and then detects the reframing by use of these two analytical tools. We performed two experiments in this paper. As a result, we think these tools were effective. We want to pursue accuracy more in future.

Keywords: Reframing, Timing, Mediation, Conciliation, Toulmin's Diagram, Argument Structure, Issue Transition, Topic Flow, Pattern Filter.

1 Introduction

Mediation is one of the means of ADR (Alternative Dispute Resolution), and conciliation is court-

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brokered mediation. Reframing is one of the mediation techniques and effective as a means of making a breakthrough when mediation came to a stalemate. In mediation, however it is difficult for a mediator to detect a stalemate without an exception. In addition, it is difficult for him to decide when to use reframing even if he detected a stalemate. But a computer observing contents of the mediation detects a stalemate of the mediation and gives a plan of appropriate reframing, which will be helpful for the mediator. As the first step of such a system, our study objective is to detect reframing using tools and show the effectiveness of those in this paper.

Reframing has become a popular teaching focus in organizational and management education [1]. "MediateMe.com" is an online marketplace connecting mediators from all backgrounds with disputing parties to facilitate quality resolutions for any type of dispute [2]. Further, the video education of mediation is deficient in that it does not have interactivity. On the other hand, in the online ADR, it is difficult to find an appropriate timing in the e-mail exchange.

The purpose of our research is to develop a method of detecting reframing utterance from mediation records with the help of computer software.

We performed reframing detection with two systems. When we performed experiments, we used two analytical tools for increasing accuracy of reframing detection. Each system is comprised of respective analytical tools. The first tool parses the concept that users decided as a unit. This tool mounts an editor building "Toulmin's Diagram" [3] expressing logical structure of arguments, and detects the reframing. The second tool parses words as a unit. This tool analyzes the structure of character data of mock conciliation using "KeyGraph" [4]. And this characterizes reframing as topic shift and visualizes, and detects the reframing. As a result, we feel a response to these experimental results. We want to give degree of accuracy in future.

Following sections describe the details of these two reframing detection tools and their experiments. Section 2 shows the concept of reframing. Reframing is effective when mediation came to a stalemate. However, it depends on utterances and the context, so it is difficult to detect reframing and the appropriate timing. Section 2 shows a timing detection of reframing. Reframing is a profound technique, but it comes in a variety of types. Section 2 shows seven types of reframing. Section 3 shows the epitome of reframing detection system. As mentioned above, we performed reframing detection with two systems. Each system developed in Nitta laboratory has each analytical tool. The first is the editor building "Toulmin's Diagram," and the second is the topic extraction tool. Figure 1 shows how each system finally detects a point and classification of reframing, and extracts of large topic shift from character data of a mock conciliation. Section 4 shows the mock conciliation to cause character data to input into the system. In this hypothetical case, law students argued as an exercise. We made audio data provided through some mock conciliations into character data, and made experiments. Section 5 shows two evaluation experiments and the results of the experiments. Section 6 shows conclusions.

I am grateful to Professor Katsumi NITTA of Tokyo Institute of Technology for giving me valuable advice.

2 Reframing

Reframing takes the same situation and circumstances and then gives those "facts" a different meaning. This meaning gives us new possibilities for the action that we might take and the responses we might make. Reframing is one of the mediation techniques. It explores a situation from multiple perspectives, and has become a popular technique in the area of mediation and clinical psychology. Reframing, however, is a difficult concept for many people to grasp. People often struggle to understand how and why one should shift perspectives on a single event. Reframing demands tolerance for ambiguity, and skills in relative thinking. According to Levin [5], intent of the mediator is strongly reflected in reframing. Most Mediators intend to alleviate a feeling of tension of the party, and confirm the meanings of the words that the party used. In this way, reframing is a profound technique.

2.1 Seven Types of Reframing

According to Hall and Bodenhamer [6], as for reframing, there are various types of reframing. Seven representative techniques are as follows: "Deframing" (embodiment to make the other party's intent and issues clear), "Content Reframing" (consider another dimension of the fact), "Counter-Framing" (movement of standpoint if the stand or situation were reverse), "Pre-Framing" (viewpoint switching to the cause or past), "Post-Framing" (viewpoint switching to the result or future), "Outframing" (abstraction of the topic: generalization of the issue) and "Analogous Framing" (drawing an analogy).

We show seven directionality and utterance examples of reframing in table 1.

Table 1. Directionality and Utterance Examples of Reframing

Directionality	Examples of Utterance
Deframing	What is an issue concretely?
Content Reframing	Is not it prejudice?
Counter-Framing	How about looking from the other party's standpoint?
Pre-Framing	Why did it happen?
Post-Framing	How about the future?
Outframing	What is the purpose of you?
Analogous Framing	Consider the following analogy, for example.

2.2 Timing Detection of Reframing

Reframing is to change a frame of thinking of the person. Mediator change the frame of thinking that causes stalemate by making a remark to promote reframing, and the person becomes able to launch on a new challenge.

Depending on utterances and the context, it is difficult to detect reframing and the appropriate timing. As is widely alleged, if we say something nice at a good timing, our business and private relationship will improve and we will become very good friends. If we say something silly at a wrong timing, we will destroy the relationships which would have been great otherwise. We must understand fully the conflicting values and opposite viewpoints and say things very carefully. It is very important for mediators to detect an appropriate timing of reframing. So we advance the development of reframing detection system focused attention on topic flow.

We have discovered the following hypothesis by visualizing the reframing detection. For reframing detection, we hypothesized that observation such as the topic transition on the context, distinctive pattern of the utterance and the rest were available.

3 The Epitome of Reframing Detection System

3.1 System Components

We analyze the mediation records using two software tools (Figure 1).

The first tool mounts an Araucaria-like editor building "Toulmin's Diagram" expressing logical structure of arguments, and detects the reframing [7]. "Argument Log" is XML form. Users input argument log from character data of the mock conciliation and do tagging them. "Tagging" means that we relate each utterance to the point at issue.

As for reframing, there are various types of Reframing. For this reason, we collected "words and groups of the classification" which are often included in reframing utterances and the system detects reframing candidates using the dictionary which we made in advance.

By the method of those word pattern, a number of utterances are extracted, which have no effect of reframing. So we have equipped "Transition Pattern Filter of Utterance Role" and "Pattern Filter of Argument Structure & Issue Transition" to the need of narrowing decision.

"Transition Pattern Filter of Utterance Role" does tagging on the classification that watches utterance role. For these roles, there are ten kinds of the "Claim," "Description," "Close-ended Question," "Open-ended Question," "Proposition," "Request," "Conversion," "Answer," "Supportive Response," and "Others."

In addition, some ineffective utterances are extracted because of spelling inconsistency and abbreviation. Therefore it is necessary to narrow down the options of reframing. What we have found is that reframing utterance make an appearance only in "Claim," "Closed-ended Question," "Open-ended Question," and "Proposition" through the experiments. The options are narrowed down to these four utterance roles.

"Pattern Filter of Argument Structure & Issue Transition" parses how an argument advances, by doing so this filter narrows down the input data. It can be determined whether the argumentation at some point is insufficient by keeping argument structures as prior knowledge in this system. The

system finally detects a point and classification of reframing, and output it. The system structure of tool 1 is as pictured in the figure 1.

The second tool 2 is "Topic Extraction Tool" [8], which parses words as a unit. As the system reads data, this tool extracts nouns and verbs (the original form) from character data of the mock conciliation, and clusters them into several groups based on co-occurrence of each pair of words. Each group corresponds to a topic, and utterances which contain more than one topic are assumed to be important because they may change of topics.

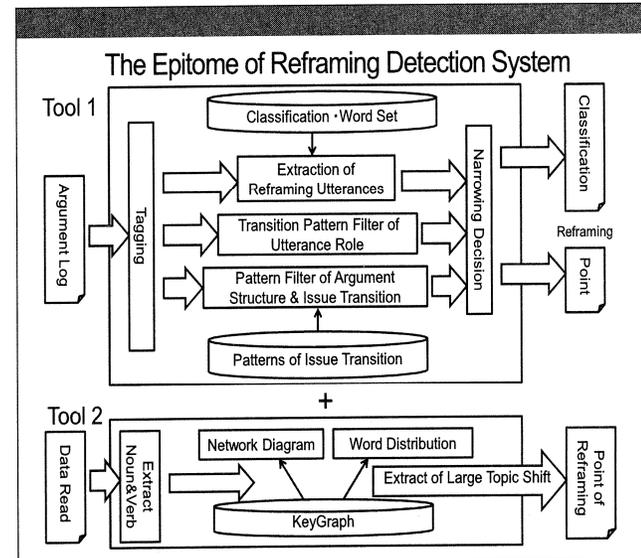


Fig. 1. Epitome of Reframing Detection System

3.2 Pattern-based Reframing Detection

It is difficult to detect a timing of the reframing even in civil conciliator. Almost experienced civil conciliators detect it unconsciously. We will think about a case of the mock conciliation to speak in this Section 3. As pictured in the figure5, the adverse party insists on full payment owing to his bad health in f4. Generally, many sufferers claim the cost of medical care if aftereffects of whiplash syndrome come out.

However, "CSF hypovolemia" (cerebrospinal fluid hypovolemia) which is the cause of aftereffects is not legally sufficient cause of whiplash syndrome. In other words, all doctors do not regard "CSF hypovolemia" as the whiplash syndrome.

"Warrant" is always required to say that "a Claim" is right although it is not often stated clearly for reasons of the common sense and is only omitted by many utterances. As pictured in the figure 4, in

this pattern 1, a background of the claim or objection is not shown or insufficient. If the conciliator understands such a pattern, the dispute may go to the settlement progressively smoothly without falling into a stalemate.

Pattern 1: If an argumentation is insufficient, an argument comes to a stalemate. Reframing makes an appearance when an argument becomes stalemate. In this pattern, a background of the claim or objection is not shown.

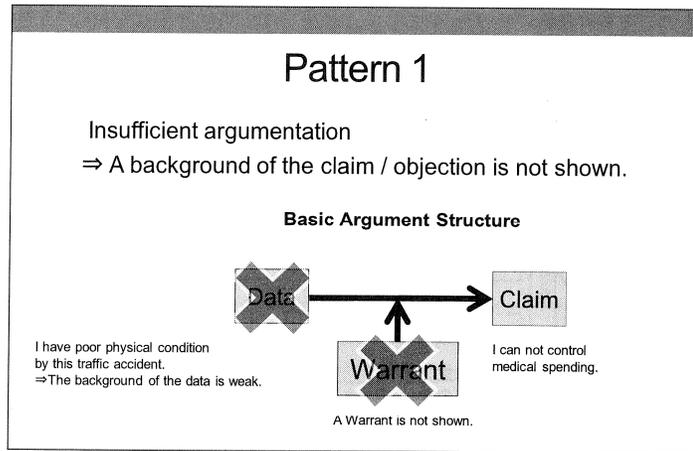


Fig. 2. Detection Pattern 1

We explain pattern 2 using figure 3. The adverse party wandered about various hospitals one after another to search for a cause (f5). The cause of the disease finally became clear at a hospital of sixth visit. As a result, he insisted that the treatment costs became expensive more than expected. Though he should argue why the injured party did not go to the superior hospital from a beginning, the perpetrator did not make a rebuttal statement. If the perpetrator made a rebuttal statement, the injured party would argue the difficulty of the finding of "CSF hypovolemia", and the argument validly advanced. If a mock conciliation is over and chases a topic flow with such a diagram, we may understand the validity of pattern 2 for reframing detection.

We will look at another point. The perpetrator insists that the injured party has a liability for negligence (f19). In this case, the injured party should make a rebuttal statement. That is, the injured party has no liability for negligence. This is because legal damages decrease. However, an argument continues without surrebuttal being made. In this point, mediator should do reframing. The civil conciliator can find a key to settlement in comparative fault.

Pattern 2: If an argument goes for basis of the rebuttal without surrebuttal being performed, an argument comes to a stalemate.

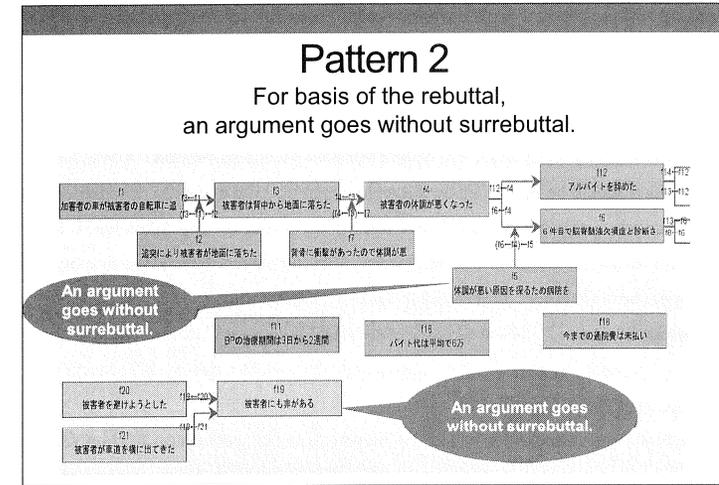


Fig. 3. Detection Pattern 2

3.3 Reframing Detection based on Topic Shift

The topic extraction tool regards reframing as a large topic shift. And it is able to visualize a topic shift. This system regards word distribution as a topic. If word distribution turns into a lot, this system regards it as a large topic shift.

As previously explained, the second tool regards word distribution as a topic. We understand that the point where the word distribution changed significantly is where a topic diverges. We regard reframing as topic diversion and visualize it with this tool. Furthermore, it classifies the words that are easy to appear together, and extracts the topic. The system calculates the strength of the connection between words and performs such a topic extraction. Additionally, it conducts an analysis of data, and displays a key word derived from analysis as a network diagram.

4 Mock Conciliation

The mock conciliation to cause character data to input into the system is as follows.

4.1 Mock Conciliation

Everyday many things are disputed before going to trial. In a trial, one person wins and the other person loses (Win-Lose solution). On the other hand, in a mediation (or conciliation), one person wins and the other person wins (Win-Win solution). Win-Win solution usually benefits both sides to conciliate because they find a middle ground and a solution that benefits both of them. Thus, conciliation can be a peaceful dispute process.

It is beneficial for everybody to simulate what would go on before a trial takes place. Mediation is an effective skill for anyone. The skills in mediation (especially the skill of Reframing) are terrific in terms of listening to the other party and understanding the limits of compromise. As real civil conciliation is closed to the public and consequently many data are blocked by the closed principle and are not released, mock conciliation will be an effective educational method.

Mock conciliation should be performed as if it were a genuine civil or family conciliation. We made some mock conciliation experiments and Hirata made some scenarios. The following is one of those scenarios. This role-play conciliation can be repeated with the players switching roles. Students with different personalities will bring considerably different characters to each role, making the experience of each interaction unique.

4.2 The scenario of Mock Conciliation

While an undergraduate went to his school by bicycle, a car of perpetrator hit him from behind. The injured party (the student) got off balance and turned over. Furthermore, he landed heavily on his back. Since then, he got out of shape and consulted doctors. Nevertheless, some doctors had no identifiable etiology; he wandered about various hospitals one after another. The cause of the disease finally became clear at a hospital of sixth visit.

The disease name is "CSF hypovolemia (cerebrospinal fluid hypovolemia)." The student (injured party) really thought that the perpetrator should pay in full hospital bills and charges because he was diagnosed "CSF hypovolemia" at the sixth hospital.

On the other hand, the perpetrator side made petition civil conciliation in the court for fear of treatment costs becoming expensive.

In this hypothetical case, law students argued as an exercise. (Hirata Seminar, Asahi Univ. 2011/11/8)

4.2.1 The players

These mock conciliations require at least five players: the proponent (motorist), the adverse party (student), the judge (chairperson of the conciliation committee), two conciliators (in the case of family conciliation, the conciliation committee members are organized in a man and woman pair), lawyer for the proponent, and lawyer for the adverse party.

4.2.2 Improvisation

The students playing the parties (proponent and adverse party) can feel free to embellish these stories as long as the scenario remains realistic.

4.3 Previous Arrangement of Mock Conciliation

Students have to learn main three techniques beforehand. Next, category of statement, and list of abbreviations should be remembered. Third, various types of reframing techniques should be learned beforehand.

4.3.1 Main Three Techniques & List of Abbreviations

Paraphrasing [Par], Reframing [Ref], Open-ended Question [OQ]

4.3.2 Category of Statement & List of Abbreviations

Claim (Insistence) [Ins], Proposal [Prp], Proposal of Process [PoP], Confirmation [Cnf], Agreement [Agr], Opposite [Ops], 5WIH Question [MMQ](Meta-Model Question), Closed-ended Question [CQ], Open-ended Question [OQ], Answer [Ans], Nomination [Nmn], and Nod in Response [Nir]

5 Evaluation Experiments

5.1 The Experiment with the editor building "Toulmin's Diagram"

If we do tagging on utterance record of students in the mock conciliation and the editor building Toulmin's Diagram visualized it, we come to be able to detect a stalemate easily. The editor has detected Utterance ID 204 (type="NoData" target="203" speaker="civil conciliator T" mien="cool", <issue>post-framing, f60</issue>). But the editor did not detect Utterance ID 42(<issue>f22, f24, type="NoData" target="41" speaker="civil conciliator O" mien="cool"). As the result, accuracy rate were 50%. Though the tool1 (editor) was not able to detect all automatically as described earlier, we have found two detection patterns in the visualized diagram.

The figure 4 shows that the adverse party (the student) insisted on full payment (total of ¥680,000) (f17), and the proponent party (the motorist) cannot accept full payment (f24). This diagram shows the conflict between the two parties. The breakdown of the amount of money (¥680,000) of the adverse party is f9 (amount already paid=¥300,000) +f10 (Epidural Blood Patch costs=¥300,000) +f15 (income by working part-time=¥80,000), but, in fact, this clearly indicates a breakdown of ¥680,000, and it is unsupported claim (without Warrant). In other words, the basis does not exhibit why the student wants the proponent party to pay total of ¥680,000.

Pattern 1 shows that the argument becomes stalemate here. The conciliator should make reframing at this point. The system was not able to do reframing detection automatically, but if there is the help of this diagram, the conciliator may detect appropriate timing of reframing easily.

Next, we want to inspect it based on a pattern 2: If an argument goes for basis of the rebuttal without surrebuttal being performed, an argument comes to a stalemate. The proponent side rejected full payment (f24) because if it was normal medical inspection, ¥300,000 would not be demanded (f23). In contrast, the adverse party (the student) should do surrebuttal under ordinary circumstances, the injured student should provide an etiologic explanation for CSF hypovolemia (cerebrospinal

fluid hypovolemia). However, the argument goes on basis of the rebuttal without surrebuttal being performed. If we watch a diagram, we can understand it easily from pattern 2.

The system was not able to do reframing detection automatically, but if there is the help of this diagram, civil conciliator may detect this point easily.

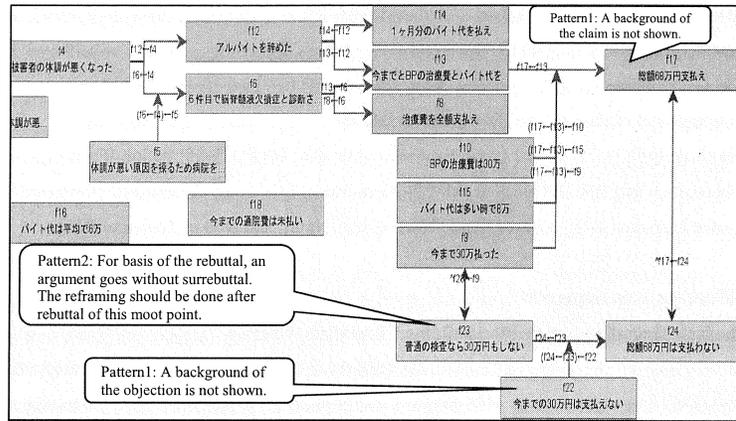


Fig. 4. The Diagram for Timing Detection of Reframing

5.2 The Experiment with the Topic Extraction Tool

We experimented with this topic extraction tool, and verified that how much presented utterances became reframing. At first we input the above-mentioned mock conciliation data into the system, and then this tool extracted topics from utterance contents. Furthermore, we examined the overlap between the answer that Hirata (civil conciliator) gave and the answer that the tool extracted. We have found accuracy rate were 37.5%.

In figure 5, we will give some examples of reframing detection with the overlapping numbers (ID) by red character. The tool extracted various kinds of reframing: There are four Counter-Framing cases (110,116,204,349), four Deframing cases (296,327,337,355), two Outframing cases (132,179), and two Content Framing cases (344,389).

Next, we will watch the examples which the tool misrecognized. The false detection includes some unnecessary utterances picked up from the utterances of some players who are not the civil conciliators, who have the right to make reframing. The analysis of the false detection will be used as a filter to make the reframing tool more precise in the future.

Let me elaborate it. The Proponent [Ins] (ID: 37), the Adverse Party [Ins] (ID: 83), the Proponent [Ins] (ID: 224), the Adverse Party [Ans] (ID: 242), the Adverse Party [Ins] (ID: 359), the Adverse Party [Ins] (ID: 250,295), Lawyer for the Adverse Party [Ins] (ID: 347), the Judge [Cnf] (ID: 399).

The above noted misdetection cases (9cases) account for 45% of the total misdetection cases

(20cases). Therefore, we think that detection ratio improves if we prevent the tool from detecting anyone other than civil conciliator. We feel a response to this effect. We want to give degree of accuracy in future.

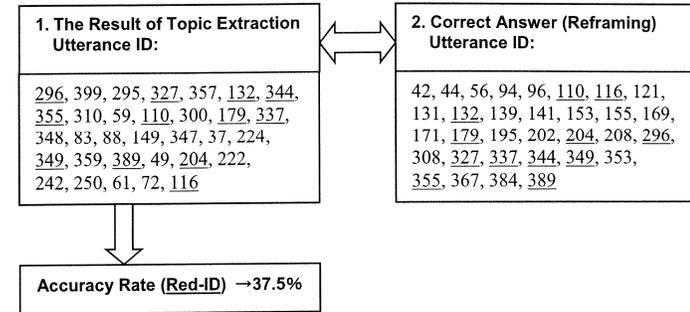


Fig. 5. The Result of Topic Extraction

6 Conclusions

As stated above, if a computer detects stalemate of the mediation and gives a plan of appropriate reframing, it is helpful for the mediator. Our study objective is to detect reframing using tools and show the effectiveness of those in this paper.

We have discovered the hypothesis for inductive method by visualizing of the reframing detection and the stalemate of argument in the mock conciliation, and we have attempted the timing detection of reframing by using this hypothesis: "Reframing makes an appearance when an argument becomes stalemate." As a result, though the editor building "Toulmin's Diagram" (tool 1) was not able to detect all automatically, accuracy rate were 50%. We feel a response to this effect.

Also the topic extraction tool (tool 2) extracted topics from utterance contents. We examined the overlap between the answer that Hirata (civil conciliator) gave and the answer that the tool extracted. We have found accuracy rate were 37.5%.

It is difficult to detect reframing and the appropriate timing. But what we have found is that it becomes obvious that "topic flow" offers hint of a solution. In spite of a relatively small percentage of extraction, we feel a response to this effect of experiments. We want to give degree of accuracy in future.

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