

Rewarding Good Negotiating Behaviour¹

Nine Key Smartsettle Algorithms

Updated by Ernest Thiessen, September 19, 2026

The Smartsettle process, using intelligent algorithms to promote “beyond win-win” outcomes by rewarding good negotiating behaviour, is a revolutionary challenge to status quo methods of negotiation.

The Status Quo

Traditional negotiations often suffer from five serious problems:

1. Relationships are harmed by using adversarial tactics
2. Weaker parties are inhibited by a power imbalance
3. Huge amounts of time and money are wasted with a tedious negotiation dance
4. Value is left on the table
5. Outcomes are unstable

To illustrate, consider an insurance claim dispute between Insurco and Claimant. While this type of dispute can be quite complex with many heads of damage, Figure 1 simplifies the negotiation problem to a single monetary issue for the sake of illustration. Claimant wants a high value and Insurco wants a low value.

A reasonable goal of such a negotiation is to determine a fair and acceptable outcome, although if the case is headed for court, the yardstick may well be different. What an acceptable outcome might be is a subjective matter and there is no way to determine that without both parties agreeing to it. One party might be forthcoming and start out with a proposal that they honestly think is fair. However, if the other party disagrees, honestly or otherwise, then they could be stuck at impasse with face-saving problems. To avoid this, negotiators will typically start out with optimistic proposals. To reach an outcome (assuming no mediator), they must resort to a negotiation dance and hope for the best.

At the beginning of any negotiation process, if someone could magically reveal the outcome and the parties would agree to it, then most of the process costs could be saved². It is that point of time that is depicted by Figure 1.

Most disputes in the current court system are treated as if they will reach the judges, when in fact, only a few of them do. As a result, the costs of going to court are incurred by most cases³, mostly due to time spent on discovery, data analysis and arguments. In related research at the UBC Faculty of Law in 2002, John Hogarth and Kari Boyle asked, “Is

¹This paper represents a significant update compared to a presentation for the 7th Annual International Forum on Online Dispute Resolution in Victoria, BC, June 18 – 19, 2008 by Ernest M. Thiessen and Paul Miniato.

²In more complex negotiations involving multiple decision variables, the potential benefit of early intervention also includes uncovering hidden value that cannot be depicted with this simple model. In high-value negotiations, the value of wasted time is often dwarfed by inefficiencies due to value left on the table.

³These opinions are based on a verbal conversation on February 22, 2006, with Chief Judge Hugh Stansfield, Provincial Courts of British Columbia.

Mediation a Cost-Effective Alternative in Motor Vehicle Personal Injury Claims?" They concluded: "The most cost-effective method of resolution for all parties is early direct negotiation. All parties benefit from early and fair resolution."

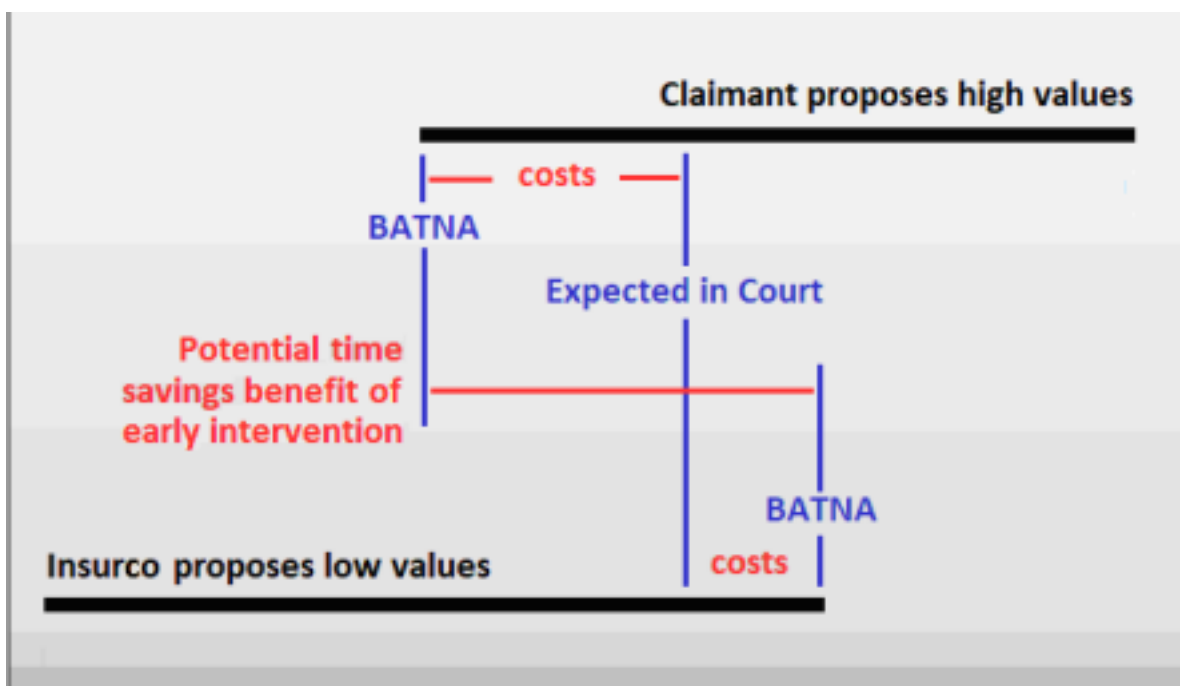


Figure 1. A Simple Model of Dispute Resolution

Claimant initially proposes higher settlement values than expected in court and Insurco proposes lower values than expected in court. Each party's BATNA⁴ is the expected outcome in court adjusted by the expected costs in getting to that outcome. The sum of the expected costs of preparing for court represents the potential benefit of early intervention.

The Smartsettle Alternative

iCan Systems Inc., headquartered in BC, Canada, has developed a suite of products code named Smartsettle ONE2∞ that are available through Smartsettle Resolutions Inc. The simplest version, Smartsettle ONE, is a negotiation platform optimized for negotiations that can be easily reduced to a single numerical issue. ONE excels in saving time, virtually eliminating the tedious negotiation dance that characterizes most traditional negotiations. The more comprehensive Infinity is an interactive and dynamic multiparty collaboration system that encourages adversarial negotiators with a win-lose attitude to cooperate in looking for a solution beyond win-win. It helps decision makers model their negotiation problem, complete with their private preferences. Infinity uses optimization to uncover hidden value in cases with any number of quantitative and qualitative issues.

⁴BATNA is a commonly used acronym for "Best Alternative To a Negotiated Agreement". In our example, we assume that the costs of negotiating and securing the BATNA are part of it.

Smartsettle is powered by augmented intelligence and proprietary algorithms designed to encourage a collaborative approach that overcomes the problems that plague traditional adversarial negotiations, from very simple to the most complex on earth.

Negotiators using Smartsettle products communicate via a secure neutral server on the Internet (Figure 2). The neutral site allows negotiators to stay in control of a Visual Blind Bidding⁵ process that is designed to identify and reward good negotiating behaviour and quickly produce fair and efficient outcomes.



Figure 2. Neutral Server

Smartsettle employs a neutral server on the Internet that acts as an unbiased, super-intelligent and totally trusted automated mediator that understands how each party becomes satisfied – augmented intelligence at its best. The server uses optimization algorithms to suggest efficient outcomes. Imagine optimization algorithms as a recipe that is used by the neutral server to take ingredients from the parties and return something good back to them.

The Smartsettle process may be entirely online or some combination of online and face-to-face. Whether or not parties should meet face-to-face depends on several factors such as:

- their personal preferences
- physical distance between the parties
- time schedules
- the state of the current relationship, and
- the importance of future relationships.

⁵<https://www.smartsettleresolutions.com/post/serving-algorithms>

Nine Key Smartsettle Algorithms

The Smartsettle neutral site employs nine sophisticated optimization algorithms to simplify complex negotiations, keep party preferences confidential, and generate Suggestions for achieving the objectives of fairness⁶ and efficiency. They are listed in the logical order in which they come into play, which for the pathways to agreement (algorithms 4 to 7) is also an order of increasing severity.

1. **Single Negotiating Framework**SM (SNF)
 - problem modelling for package analysis
 - establishes context and agreement conditions
2. **Comprehensive Preference Analysis**SM (CPA)
 - preference elicitation and representation
 - ensures the most intelligent solution possible
3. **Visual Blind Bidding**SM (VBB)
 - proposal exchange and suggestion generation
 - saves valuable time
4. **Share The Overlap**SM (STO)
 - distribution of the overlap in a fair and unbiased way
 - encourages collaboration and fosters trust
5. **Reward Collaborative Behaviour**SM (RCB)
 - overlap allocation based on movement in the final session
 - discourages holding back and motivates collaboration
6. **Small Gap Closer**SM (SGC)
 - closing a small gap to avoid impasse
 - increases settlement rates with adjustable “gap-bridging”
7. **Expert Neutral Decider**SM (END)
 - voluntary human intervention as a last resort
 - guarantees a settled value when both parties opt in
8. **Fairness Enhancing Normalization**SM (FEN)
 - satisfaction scale adjustment
 - makes MMG fair among all the parties and prevents gaming
9. **Maximize the Minimum Gain**SM (MMG)
 - optimization beyond the Baseline
 - harvests and fairly distributes hidden value

Following, each of these algorithms is described in more detail explaining how they play out in a general multivariate case.

⁶Fairness is like beauty; it exists almost entirely in the eye of the beholder (http://andrewolmsted.com/archives/2007/01/the_beauty_of_f.html). Fairness achieved with Smartsettle is determined by the negotiators themselves. They pre-determine the fairness of the outcome by first accepting the process as fair. It's like the slicer-picks-last rule. Most people perceive that to be a fair procedure because it strikes a fair balance between the importance of the outcome and the cost of getting there (<http://legaltheorylexicon.blogspot.com/2004/02/legaltheory-lexicon-023-procedural.html>).

1. Single Negotiating Framework (SNF)

The Smartsettle negotiation process begins with the creation of an SNF (see Figure 3). The SNF may be the final agreement except for blanks that represent issues not yet agreed. Negotiators identify a negotiating range for every issue in the SNF. They may also wish to discuss certain facts of the case that may make a difference to their preferences. This part of the process starts the negotiation off on the right foot by encouraging negotiators to focus on their own interests rather than on winning. This is designed to avoid adversarial confrontation, encourage relationship building and clear the path toward mutual gain.

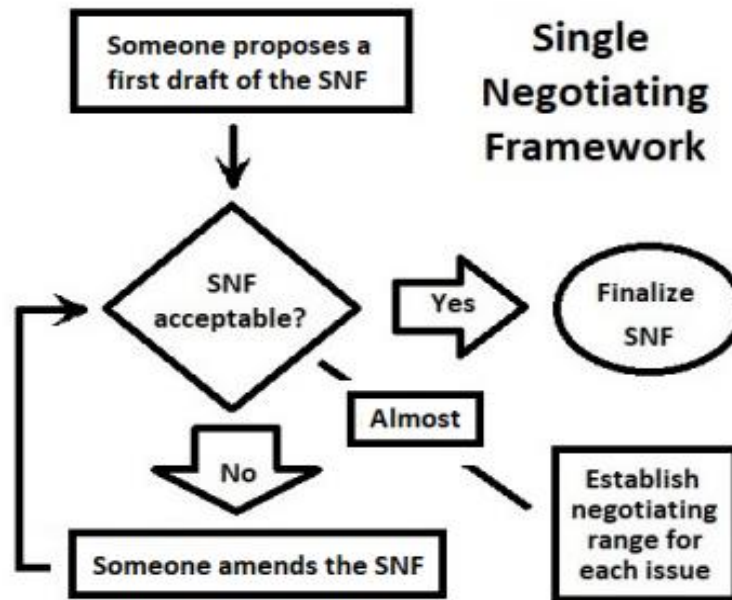


Figure 3. Single Negotiating Framework Algorithm

How to build a Single Negotiating Framework is not easy to specify in detail. The artistic skills of a trained facilitator will paint a different picture every time. Still, from a high level you can see an algorithm that produces a comprehensive document with blanks and negotiating ranges for every issue yet to be resolved.

If convenient face-to-face meetings are not easy to arrange, video or phone conferencing can also be productive venues for creation of the SNF. Once the SNF is in place, parties may proceed efficiently online with the exchange of proposals and then come back to a warm physical handshake at the end of that process. If the SNF reduces to a single numerical issue, parties may choose to complete their negotiations with ONE.

2. Comprehensive Preference Analysis (CPA)

After producing a complete draft of an SNF, the next step is to model the problem and how each party becomes satisfied on each issue. Smartsettle elicits preferences in various intuitive ways that do not require subjective quantification. After preferences are represented accurately it is possible for Smartsettle to assign ratings to packages.

3. Visual Blind Bidding (VBB)

Smartsettle's unique VBB⁷ gives Smartsettle negotiators the best of all worlds in that it supports both visible proposals and secret bids⁸. Once their negotiation is modelled with all the issues, parties may commence to exchange proposals using VBB. These are issue values in single-issue negotiations or complete packages in multivariate negotiations. Packages can be displayed and compared conveniently using the negotiation panel graphical interface.

Parties start the first session with visible proposals within the established negotiating ranges. Since the system knows the preferences of all parties it can also participate by generating Suggestions⁹. Parties inspect and evaluate packages as they arrive. If a party is willing to sign any of them, then they can indicate that by placing secret bids on those favoured Suggestions, as depicted by Figure 4.

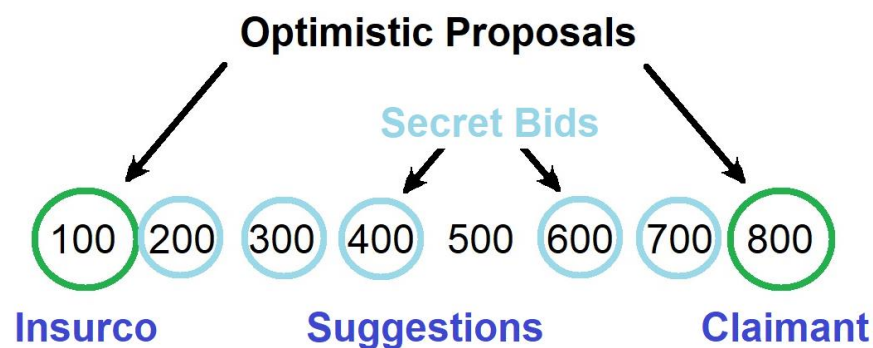


Figure 4. Secret Bids on Suggestions

The Smartsettle Visual Blind Bidding process encourages parties to begin with visible optimistic proposals. This illustration depicts the negotiation of a single numerical issue with a negotiating range between 100 and 800. Rather than continue with a tedious negotiation dance, parties may request "Suggestions" on which each party can place secret bids. Neither party knows which values (or packages)¹⁰ the other party has accepted until they both accept the same value (or package).

In each subsequent session, parties may offer concessions that will narrow or adjust any visible gaps that may be particularly wide or lopsided. Whenever either party feels that they have conceded as far as they should, then they may declare Final Session. This feature makes sure that a negotiation does not remain stalled or deteriorate into the same tedious negotiation dance that it is designed to eliminate.

⁷Smartsettle's method of blind bidding differs from ordinary blind bidding in what is blind. In traditional blind bidding, the proposals (offers and demands) are blind. In Smartsettle's method, every proposal is visible, and only the acceptance of a value or package is secret until there is a deal.

⁸We say "bid" for colloquial clarity but it's really the acceptance that is secret, not the bid itself. Smartsettle first generates Suggestions visible for all to see (not secret) and then the parties decide whether to secretly accept them.

⁹Suggestions may be generated by the system or submitted anonymously (as Masquerades) by any party. In a single-issue case the Suggestions are single values. In multivariate cases Suggestions are packages comprised of values for all the issues.

¹⁰The range in this example is from 100 to 800. These numbers could represent currency in a single-issue negotiation. In a negotiation over multiple issues, these numbers could represent satisfaction ratings for packages, in which case they would not be uniformly distributed, and the scale would appear differently to each party, depending on their preferences.

An agreement¹¹ is declared when the system records an overlap of the secret bids at the end of a session or if the gap is small enough to trigger the SGC. If there is no settlement, all the parties learn is that one or more of them will need to “try harder” in the next session if a deal is to be reached. However, no party has revealed anything to another that can be taken advantage of.

With Smartsettle’s server-based technology, progress towards agreement is made both synchronously and asynchronously to make the best use of each party’s scheduling constraints. Structuring the negotiation process with sessions helps asynchronous communications progress more quickly since each party can make at least two moves per turn. A session would usually be in progress when a party returns to the negotiating panel. That party would typically make a move to end that session and then, if there has been no agreement, make another move to start the next session. If the party makes both a visible and a secret bid in each session, then one turn could actually consist of four moves (or even six if you count the SGC moves). The VBB process results in earlier agreements and virtually eliminates the tedious negotiation dance that characterizes most ordinary negotiations.

Four Pathways to Agreement

Whether a negotiation involves a single numerical issue in Smartsettle ONE or many issues and parties in Smartsettle Infinity, Visual Blind Bidding can reach agreement in four ways. They are listed here in order of increasing severity, and the last three correspond to the algorithms described in the sections that follow.

1. **Open acceptance.** The simplest and fastest pathway is for a party to accept a visible proposal from another party. If that value or package is acceptable, the negotiation is done at once.
2. **Overlap of secret acceptances.**¹² The most common pathway is for the parties’ secret acceptances to overlap at the end of a session, producing a Zone of Agreement. Share The Overlap declares the agreement, and Reward Collaborative Behaviour determines where within the zone it falls (sections 4 and 5).
3. **Small Gap Closer.**¹³ If the secret acceptances come close but do not overlap, each party is asked to confidentially indicate how much further they would extend their acceptance, conditional on the other party also extending theirs. The gap is then closed using Reward Collaborative Behaviour applied to the parties’ last moves, so that it is not split evenly but divided in favour of the more collaborative party (section 6).
4. **Expert Neutral Decider.**¹⁴ If Final Session ends with the parties too far apart for the Small Gap Closer, and both parties have voluntarily chosen to proceed with the Expert Neutral Decider, the opinions of Expert Neutrals establish what is fair and Reward Collaborative Behaviour favours the party closest to fair (section 7). The

¹¹In Smartsettle Infinity, this deal is considered a Baseline agreement. To make sure that no value is left on the table, parties may request an improvement. Smartsettle uses an algorithm called “Maximize the Minimum Gain” to generate another suggestion on the Efficiency Frontier. How close Smartsettle comes to achieving this objective depends on how well parties have represented their preferences.

¹²Video demonstration: <https://www.youtube.com/watch?v=IWjXeEd8fck>

¹³Video demonstration: <https://www.youtube.com/watch?v=BcF9C8tq9AQ>

¹⁴Video demonstration: https://www.youtube.com/watch?v=P-_LWKLrb0Q

mere availability of this pathway encourages reasonable moves in Final Session, and in practice it is rarely needed.

Reward Collaborative Behaviour is the thread that runs through the three algorithmic pathways: it places the deal within an overlap, divides a small gap, and favours the party closest to fair when Expert Neutrals are consulted. Throughout, what is secret is only each party's acceptance; every proposal and Suggestion is visible to all. This is what makes the method scalable to any number of issues and parties, and it distinguishes Visual Blind Bidding from double blind bidding, in which the offers themselves are hidden and which is limited to a single issue between two parties.

In multivariate cases, whichever pathway produces the agreement, the result is a Baseline, and the process is always capped by Maximize the Minimum Gain (section 9) to make sure that no hidden value remains.

4. Share The Overlap (STO)

Share The Overlap is the algorithm behind the most common pathway to agreement. Each negotiator has a zone of acceptability, and if agreement is to be found these zones must overlap. That overlap is the Zone of Possible Agreement, or ZOPA — the range within which a deal exists, whether or not the parties ever find it. What they discover in any one session is narrower: the Zone of Agreement, made up of the values or packages that every party has actually accepted by the end of that session.

Parties who have agreed in advance to Share The Overlap are done as soon as Visual Blind Bidding produces such a zone. No further bargaining is needed, because they have already accepted that the agreement will fall inside the zone and that Reward Collaborative Behaviour, described in the following section, will determine where.

5. Reward Collaborative Behaviour (RCB) (aka Smallest Last Move)

Collaborative movement is promoted by rewarding the party who concedes to a realistic position rather than holding back. The reward is calculated by an algorithm¹⁵ that favours whoever made the smallest last move¹⁶. A party who has already moved to where they honestly expect agreement has little left to concede in the final session, so holding back and then conceding in one large step is counterproductive.

Figure 5 depicts a hypothetical scenario where Claimant is rewarded. For ease of illustration, the simplest possible case is illustrated here, i.e., negotiation of a single numerical issue.

¹⁵The formula used for determining the agreement value simplifies to the following for the example shown in Figure 5:

$$\text{Value} = (Sc \times Fc + Si \times Fi) / (Sc + Si)$$

where

Fc = final secret bid of Claimant

Fi = final secret bid of Insurco

Sc = size of Claimant's move in the last session

Si = size of Insurco's move in the last session

¹⁶RCB (aka SLM) contrasts with "split-the-difference", which is commonly used in other blind bidding solutions. Research has shown that parties will hold back more if they expect the overlap or difference to be split evenly.

The illustration depicts actual results when using Smartsettle ONE, which is Smartsettle's entry-level product, optimized for single-issue negotiations. Using Smartsettle Infinity with complex negotiations, this method is extended to cases with multiple issues and parties.

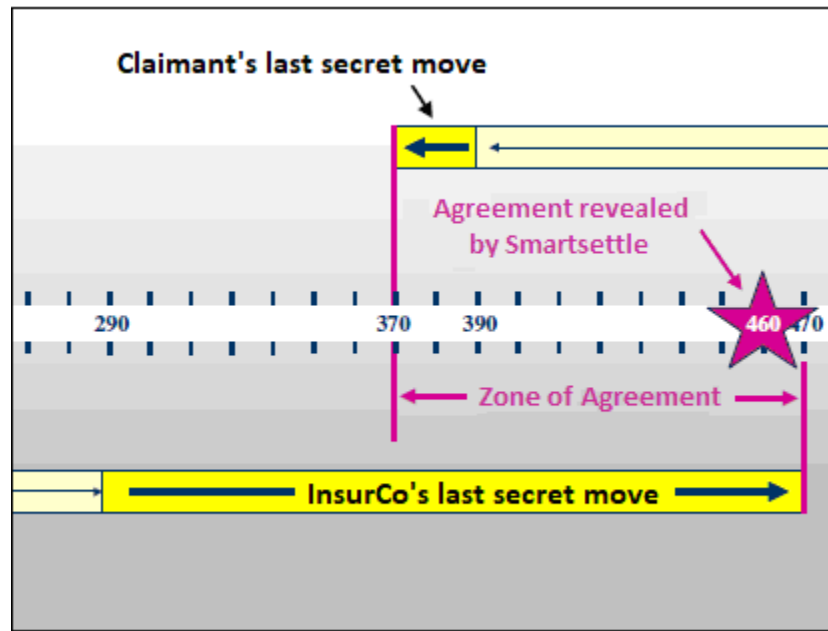


Figure 5. Reward for Collaborative Behaviour

Smartsettle ONE declares an agreement when the last moves made by the parties overlap to produce a Zone of Agreement. The yellow bars show the secret moves each party made in each session. At the end of the second-last session Insurco had accepted 290 and Claimant 390, neither value revealed to the other. In the last session Insurco accepted 470 and Claimant 370, producing a Zone of Agreement between 370 and 470: every value in that span had been accepted by both. Smartsettle declares the agreement to be 460, which proportionately rewards Claimant. Having conceded most of the distance in earlier sessions, Claimant had the smaller move left to make in the final one.

6. Small Gap Closer (SGC)

If there is no overlap at the end of a session but the parties agree that the gap is small, the Small Gap Closer offers a way to avoid impasse. Each party confidentially indicates an extension of their acceptance, conditional on the other party also extending theirs, and the gap is then closed automatically using RCB applied to their last moves. Because the gap is divided in favour of the more collaborative party rather than split evenly, both sides remain motivated to engage fully, and settlement rates increase.

7. Expert Neutral Decider (END)

Despite all the incentives, negotiators could still hold back if there were an unlimited number of sessions available. To avoid stalled negotiations, Smartsettle allows either party to declare Final Session. To further encourage parties to be reasonable in Final Session, they may also choose to use Smartsettle's Expert Neutral Decider (END).

The END is always voluntary. If it is offered in the process, the parties decide in advance which people will serve as Expert Neutrals, and either party may still opt out up to the last minute. If both parties choose to proceed and Final Session results in no deal, then the Expert Neutrals (usually three) are consulted for their opinion of fair. The middle value is considered “fair” and the RCB algorithm is used to favour the party closest to fair. Because the parties themselves have chosen this route, the END guarantees a settled value without Smartsettle ever imposing an outcome.

The END increases settlement rates simply with its existence. In practice most cases settle before they reach the END. In multivariate cases, an END outcome is a detour rather than the end of the process: the parties still return to MMG to make sure that no hidden value remains.

8. Fairness Enhancing Normalization (FEN)

Smartsettle allows parties to represent their preferences with any scale that is convenient to them. FEN is required only for MMG, where it makes the improvement fair and prevents gaming. Under the covers, normalization neutralizes any effort by any party to inflate the benefits of optimization for themselves.

9. Maximize the Minimum Gain (MMG)

Once a Baseline has been agreed to, by whichever pathway, Smartsettle employs a special algorithm that uncovers any remaining hidden value and distributes it fairly to all parties. MMG always caps the process. Maximize the Minimum Gain as described in iCan’s US Patent 5,495,412 has been slightly modified to better deal with multiple party negotiations. This algorithm is foundational to all the others.

Conclusion

Table 1 summarizes how Smartsettle rewards good negotiating behaviour. Acceptance of a fair outcome is the first prerequisite for achieving a result that benefits both parties, and it opens the simplest pathway to agreement. Smartsettle enables this behaviour in a process where parties can place secret bids on packages. When a Zone of Agreement occurs, the party who made the smallest last move is rewarded with a bigger portion of the overlap, and the same reward applies when a small gap is closed. A settled value is guaranteed if both parties voluntarily choose the Expert Neutral Decider in Final Session, and in fact agreement is more likely to happen without the need of outside intervention. These first three behaviours all contribute to quickly achieving a fair outcome and are applicable to all negotiations, whether simple or complex.

Table 1: Smartsettle Rewards for Good Negotiating Behaviour

Objective	Behaviour	Reward
Fairness	Acceptance of a fair outcome	A timely win-win outcome
	Collaborative movement toward the Zone of Agreement	Bigger portion of the overlap (or of a small gap)
	Voluntary agreement to the Expert Neutral Decider	Guaranteed settled value
Efficiency	Secure honesty & truthfulness	Uncovered hidden value
Peace	Collaboration	Improved relationships

In more complex multivariate cases, the importance of coming to an early agreement is even greater. In addition to time savings, negotiators also have the opportunity of discovering hidden value with the fourth behaviour of secure honesty and truthfulness. Figure 6 illustrates the magnitude of value often left behind in ordinary negotiations. Research¹⁷ shows that negotiators that are subjected to a tedious negotiation dance become exhausted and have little energy left to go “beyond win-win”® in a search for hidden value. The Smartsettle VBB process not only conserves the energy of negotiators but makes it very easy to uncover hidden value.

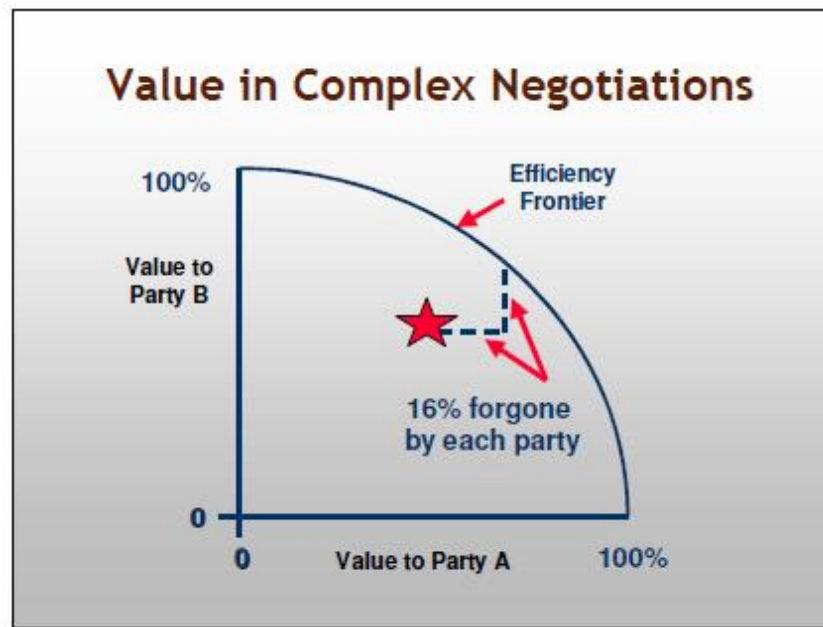


Figure 6. Value Forgone in Complex Negotiations

Substantial value is often left on the table in complex negotiations. Research by Thiessen¹⁸ pointed to a typical value of 16% forgone by each party.

¹⁷1999, Shell, G. Richard, *Bargaining for Advantage: Negotiation Strategies for Reasonable People*. New York: Penguin. ISBN 0 14 02.8191 6 paper.

¹⁸1992, Thiessen, E.M., and D.P. Loucks, "Computer-Assisted Negotiation of Multi objective Water Resources Conflicts," *Water Resources Bulletin*, American Water Resources Association, 28(1), 163-177, February.

In traditional negotiations, parties will often tend to hide or even misrepresent their true preferences. However, with Smartsettle Infinity, which is a comprehensive eNegotiation system that addresses all the challenges set forth in this paper, the temptation to misrepresent preferences is eliminated. Skilled facilitators help parties understand that it is actually counterproductive to use any sort of deception as a negotiating strategy and that truthfulness is rewarded. All of these good behaviours together represent the fifth behaviour of collaboration, and result in improved relationships.

Smartsettle Vision

***Conflict resolved in a
more peaceful, collaborative & intelligent way
throughout the world¹⁹***

¹⁹Please visit www.smartsettle.com for more information.