Rewarding Good Negotiating Behaviour

Eight Key Smartsettle Algorithms

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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 adversarial negotiations 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, and
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. In order to avoid this, negotiators will typically start out with optimistic proposals. In order to reach an outcome (assuming no mediator), they must resort to a negotiation dance and hope for the best.

[1] Ernest Thiessen, President and CEO of iCan Systems Inc., is responsible for the research and development of Smartsettle. Paul Miniato was VP Software Engineering during the time that some of the features described in this paper were implemented.

At the beginning of any dispute resolution process, if someone could magically reveal the outcome and the parties would agree to it, then all the costs of dispute resolution would be saved[2]. It is that point of time that is depicted by Figure 1.

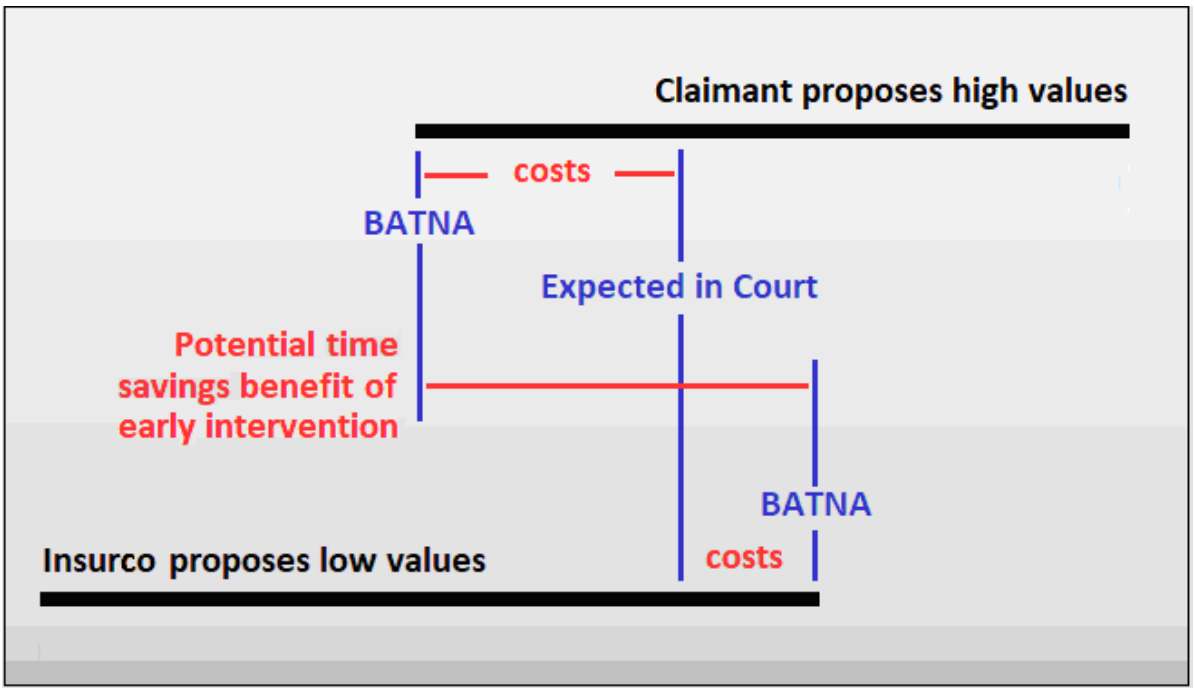

Figure 1. A Simple Model of Dispute Resolution

Claimant initially proposes higher settlement values than expected in court and Insurco proposes lower values than expected in court. Each party's BATNA[3] 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 represent the potential benefit of early intervention.

Most disputes in the current court system are treated as if they will reach the judges, when in fact, only a few of them actually do. As a result, the costs of going to court are incurred by the vast majority of cases[4], mostly due to time spent on discovery, data

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[2] In 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.

[3] BATNA 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.

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

analysis and arguments. In related research at the UBC Faculty of Law in 2002, John Hogarth and Kari Boyle asked, "Is 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."

The Smartsettle Alternative

iCan Systems Inc., headquartered in BC, Canada, has developed a suite of products code-named Smartsettle ONE2oo (Figure 2). Smartsettle is powered by artificial 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.

Figure 2. ONE2oo

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. Infinity is a comprehensive 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.

Negotiators using Smartsettle products communicate via a secure neutral site server on the Internet (Figure 3). The neutral site allows negotiators to stay in control of a Visual

Blind Bidding[5] process that is designed to identify and reward good negotiating behaviour and quickly produce fair and efficient outcomes.

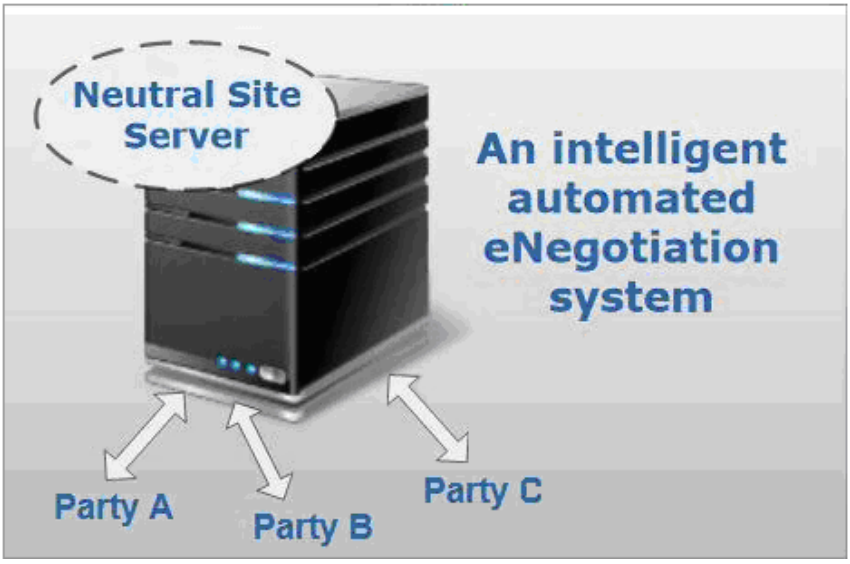

Figure 3. Neutral Site Server

Smartsettle employs a neutral site server on the Internet that acts as an unbiased, super intelligent and totally trusted automated mediator that understands how each party becomes satisfied – artificial 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 a number of 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] See https://en.wikipedia.org/wiki/Online_dispute_resolution

Eight Key Smartsettle Algorithms

The Smartsettle neutral site employs eight sophisticated patented optimization algorithms to simplify complex negotiations, keep party preferences confidential, and generate Suggestions for achieving the objectives of fairness[6] and efficiency.

1. Single Negotiating Framework (SNF) SM
   - problem modeling for package analysis
     - establishes context and agreement conditions
2. Comprehensive Preference Analysis (CPA) SM
   - preference elicitation and representation
     - insures the most intelligent solution possible
3. Visual Blind Bidding (VBB) SM
   - proposal exchange and suggestion generation
     - saves valuable time
4. Reward Early Effort (REE) SM
   - overlap allocation with early settlement incentive
     - discourages holding back and motivates collaboration
5. Automatic Deal-Closer (ADC) SM
   - closing a small gap to avoid impasse
     - increases settlement rates with adjustable "gap-bridging"
6. Fairness Enhancing Normalization (FEN) SM
   - satisfaction scale adjustment
     - enables fair comparisons among all the parties
7. Maximize the Weighted Gain (MWG) SM
   - baseline optimization algorithms
     - fairly uncovers hidden value
8. Expert Neutral Deal-Closer (END) SM
   - seamless human intervention as a last resort
     - guarantees a collaborative outcome

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

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[6] Fairness 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 4). The SNF is like a 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.

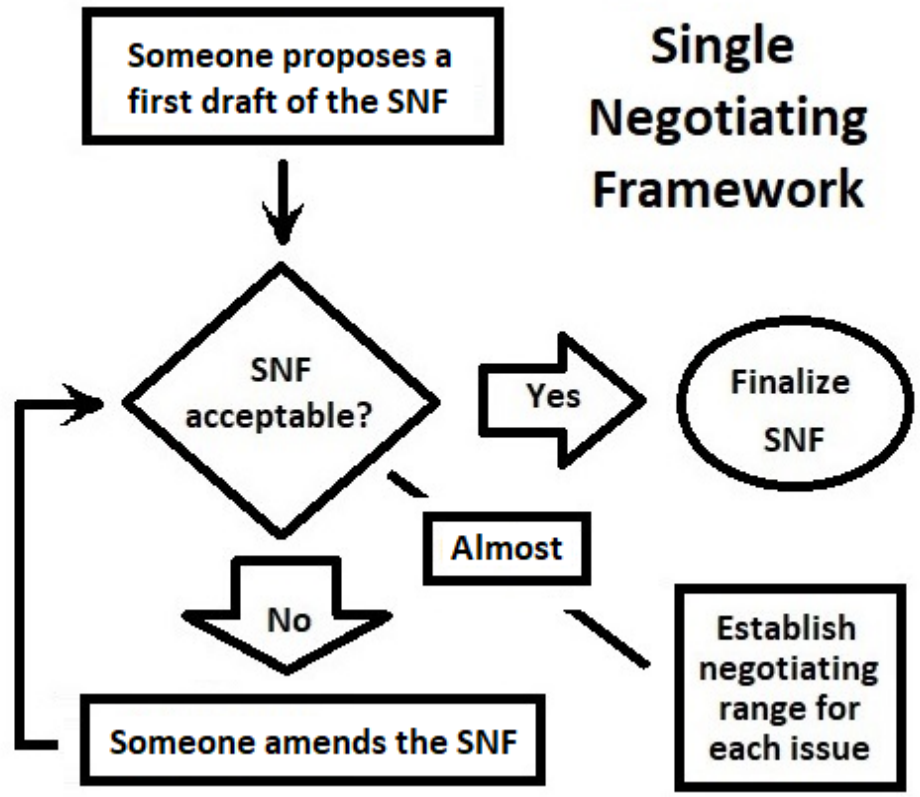

Figure 4. Single Negotiating Framework Algorithm

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 VBB[7] gives Smartsettle negotiators the best of all worlds in that it supports both visible proposals and secret bids[8]. 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 both parties it can also participate by generating Suggestions [9]. 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 5.

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.

An agreement[10] 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 ADC. If there is

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[7] Smartsettle'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, the acceptance of a value or package is secret until there is a deal.

[8] We 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 or not to secretly accept them.

[9] Suggestions 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.

[10] In Smartsettle Infinity, this deal is considered a Baseline agreement. In order to make sure that no value is left on the table, parties may request an improvement. Smartsettle uses an algorithm called "Maximize the Weighted Gain" in

no deal, 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.

Figure 5. 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. The negotiating range is between zero and 2000. 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[11] the other party has accepted until they both accept the same value or package.

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order 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.

[11] The range in this example is from zero to 2000. It could represent dollars in a single-issue negotiation. In a negotiation over multiple issues, this range might be satisfaction ratings for packages, in which case the scale would appear differently to each party, depending on their preferences.

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 due to the fact that 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 ADC moves). The VBB process results in earlier agreements and virtually eliminates the tedious negotiation dance that characterizes most ordinary negotiations.

4. *Reward Early Effort (REE) (aka Smallest Last Move)*

Early settlement is promoted by rewarding the party who makes the earliest reasonable effort to settle. Figure 6 depicts a hypothetical scenario where Claimant is rewarded. The reward is calculated by an algorithm[12] that favours[13] whoever made the smallest last move. This encourages parties to move sooner to a place where they expect to find agreement[14].

For ease of illustration, the simplest possible case is illustrated here, i.e., negotiation of a single numerical issue. 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.

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[12] The formula used for determining the agreement value simplifies to the following for the example shown in Figure 6:

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Value = (Sc * Fc + Si * 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
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[13] REE is in contrast to "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.

[14] Each negotiator has a zone of acceptability. If they are to find agreement, then these zones must overlap. The overlap is the Zone of Possible Agreement (ZOPA) in which the final agreement on whatever is being negotiated may be found. An overlap in any particular session is called the Zone of Agreement, which may be smaller than the entire ZOPA.

5. Automatic Deal-Closer

If there is no overlap at the end of any session but parties agree that the gap is small then it will be automatically closed using REE applied to their last moves.

6. Anti-Gaming Normalization (AGN)

Smartsettle allows parties to represent their preferences with any scale that is convenient to them. Under the covers, normalization neutralizes any efforts of any party to inflate the benefits of optimization for themselves.

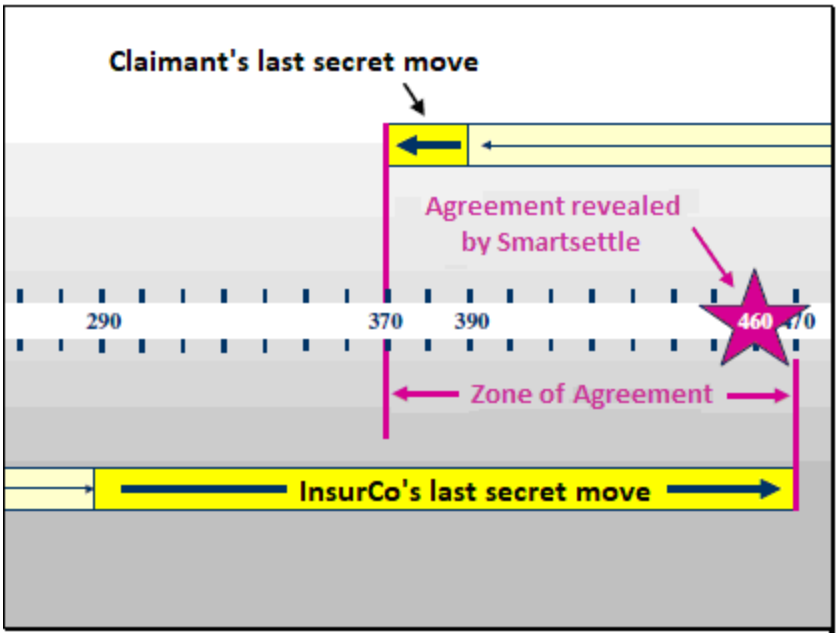

Figure 6. Reward for Early Effort

An agreement is declared by Smartsettle ONE when the last moves made by the parties overlap to produce a Zone of Agreement. The yellow bars show the secret moves made by each party in each session. At the end of the second-last session, Insurco and Claimant had accepted values of 290 and 390 respectively. These bids are not revealed to the other party. In the last session, Insurco secretly accepted a value of 470 and Claimant secretly accepted a value of 370. The final agreement could potentially lie anywhere between 370 and 470 since all values in between have been mutually accepted. Smartsettle declares the agreement to be 460, which proportionately rewards Claimant, who made an early effort to settle, evidenced by their smallest move in the final session.

7. Maximize the Weighted Gain (MWG)

Once a Baseline has been agreed to, Smartsettle can employ a special algorithm that will uncover any remaining hidden value and distribute it fairly to all parties. Maximize the Weighted Gain is the general algorithm that applies to all cases with multiple parties. For two-party problems this algorithm simplifies to Maximize the

Minimum Gain, which is the main subject of US ICANS Patent US 5495412A. These algorithms are foundational to all the others.

8. *Expert Neutral Deal-Closer (END)*

In spite of 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 can also opt to use Smartsettle's Expert Neutral Deal-Closer (END). If Final Session results in no deal, then three Expert Neutrals are consulted for their opinion of Fair. The middle value is considered "fair" and the party closest to fair is favoured[15]. The END increases settlement rates simply with its existence. In practice most cases settle before they reach the END.

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. 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. An agreement is ensured if parties agree to the Expert Neutral Deal-Closer in Final Session, and in fact 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
	Early movement to Zone of Agreement	Bigger portion of the overlap
	Agreement to Expert Neutral Deal-Closer	Guaranteed agreement
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 7 illustrates the magnitude of value often left behind in ordinary negotiations.

[15] If parties are using Infinity, parties may still wish to re-engage Smartsettle after they have a settlement to discover if any hidden value remains.

Research[16] 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.

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 of the challenges set forth in this paper, the temptation to misrepresent preferences is eliminated. Skilled facilitators help parties understand that it is actually counter productive 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.

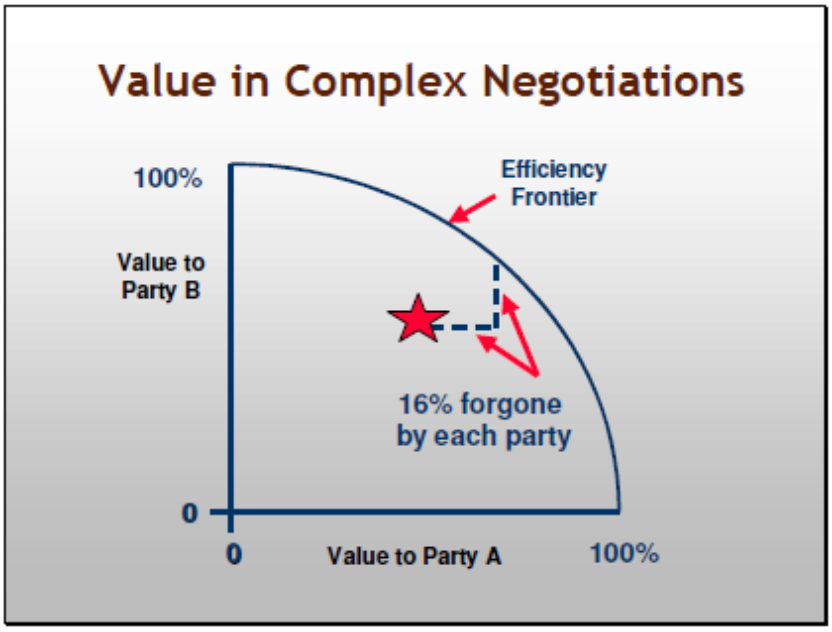

Figure 7. Value Forgone in Complex Negotiations

Substantial value is often left on the table in complex negotiations. Research by Thiessen[17] pointed to a typical value of 16% forgone by each party.

[16] 1999, Shell, G. Richard, Bargaining for Advantage: Negotiation Strategies for Reasonable People. New York: Penguin, 1999. ISBN 0 14 02.8191 6 paper.

[17] 1992, 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.

Smartsettle Vision

Conflict resolved in a more peaceful, collaborative & intelligent way throughout the world[18]

[18] Please visit www.smartsettle.com for more information.