

Mobile ODR with SmartSettle

by

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Abstract

This paper introduces a new dispute resolution term called Mobile ODR, showing that ODR systems like SmartSettle with Fat Client/Server architecture have distinct advantages in the coming wireless world over the more common Thin Client that characterizes most ODR systems in use today. The paper goes on to explain that the most important advantage of a Fat Client ODR system is the ability to put negotiators in control of a process that produces outcomes that are both fair and efficient, but that lack of cooperation among decision makers is still a significant obstacle to overcome. The paper concludes with an example of the application of Mobile ODR with SmartSettle to a negotiation between a buyer and a seller of steel strap. Mobile ODR helps two busy executives collaborate in turning a dispute over one issue into an opportunity to significantly increase the value of their agreement by optimizing decisions for all the variables in their existing agreement.

Introduction

Mobile ODR is on the horizon. Wi-Fi hotspots³ are popping up all over the place, mobile phones are being used for video conferencing⁴, and Wired, one of our favorite magazines, is thinking about renaming itself as unWired (Wired Magazine, 2003). A host of wireless devices are beginning to spread the power of instant and ubiquitous communication literally within reach of everyone (Rheingold, 2002).

Mobile ODR is discussed here in the context of the SmartSettle eNegotiation System. Maturing of the Internet and the wireless revolution are enabling SmartSettle with *Fat Client/Server* architecture to become a prime candidate to exploit the potential of *Mobile ODR*. SmartSettle excels at helping multiple parties find fair and efficient solutions to large complex multivariate

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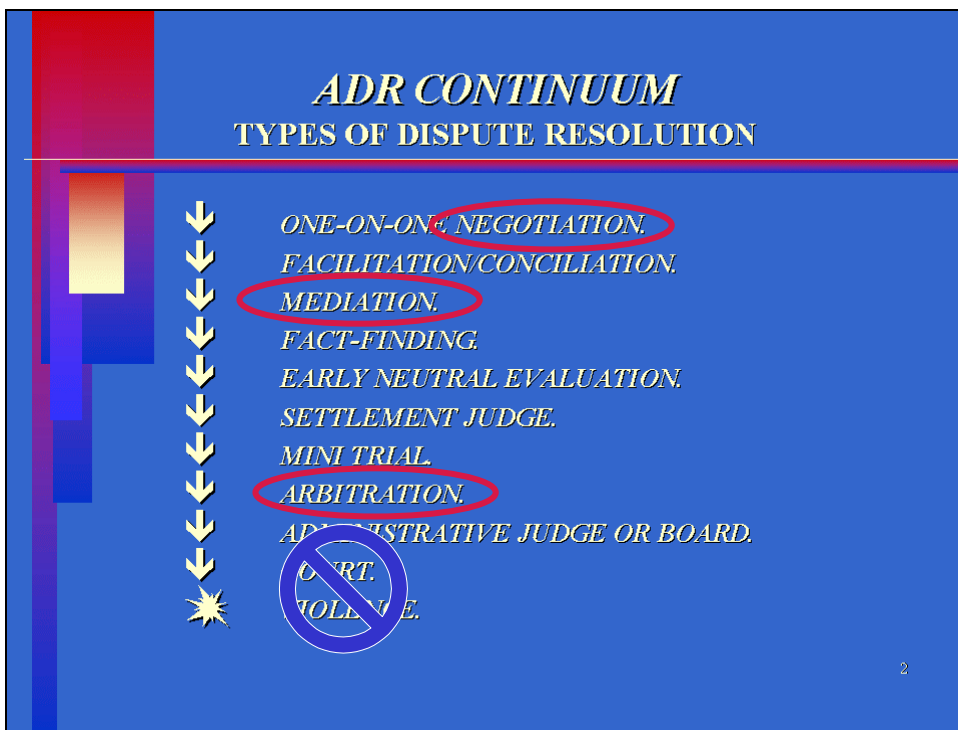
³ Wi-Fi is short for wireless fidelity referring to any type of 802.11 wireless local area network (WLAN) technology (http://80211-planet.webopedia.com/TERM/w/Wi_Fi.html viewed 2003 June 18). Hot Spot refers to a local area covered by the WLAN. A comprehensive glossary can be found at <http://www.devx.com/wireless/Door/11411> viewed 2003 June 19.

⁴ <http://www.radvision.com/> viewed 2003 July 23.

conflicts. Motivated by the age-old adage that *an ounce of prevention is worth a pound of cure*, SmartSettle has actually become much more than dispute resolution.⁵

Brief History

Online Dispute Resolution (ODR) has its roots in ADR, an acronym that commonly refers to *Alternative Dispute Resolution* and more recently also to *Appropriate Dispute Resolution*⁶. The following illustration is adapted from the US Veteran's Affairs website⁷. The various types of dispute resolution are arranged so that as you go down the list, the degree of control that a disputant has over the outcome decreases, with least control at the bottom of the list. In court, the judge hands you a decision, and disputants resorting to violence are presumably totally out of control. At the top of the list, one-on-one negotiators are completely in control of the outcome.



ADR traditionally means alternatives to court and violence. Mediation or arbitration with a trusted neutral is usually a better solution to impasse than being forced to go to court. However, if our objective is to be as far away from violence as possible, the ideal ADR solution is effective negotiation.

⁵ SmartSettle described at www.smartsettle.com is an implementation of the ICANS US Patent 5495412 based on Thiessen's doctoral research at Cornell University.

⁶ 2% according to Google search 2003 July 17

⁷ <http://www.va.gov/adr/slides.htm> viewed 2003 June 12.

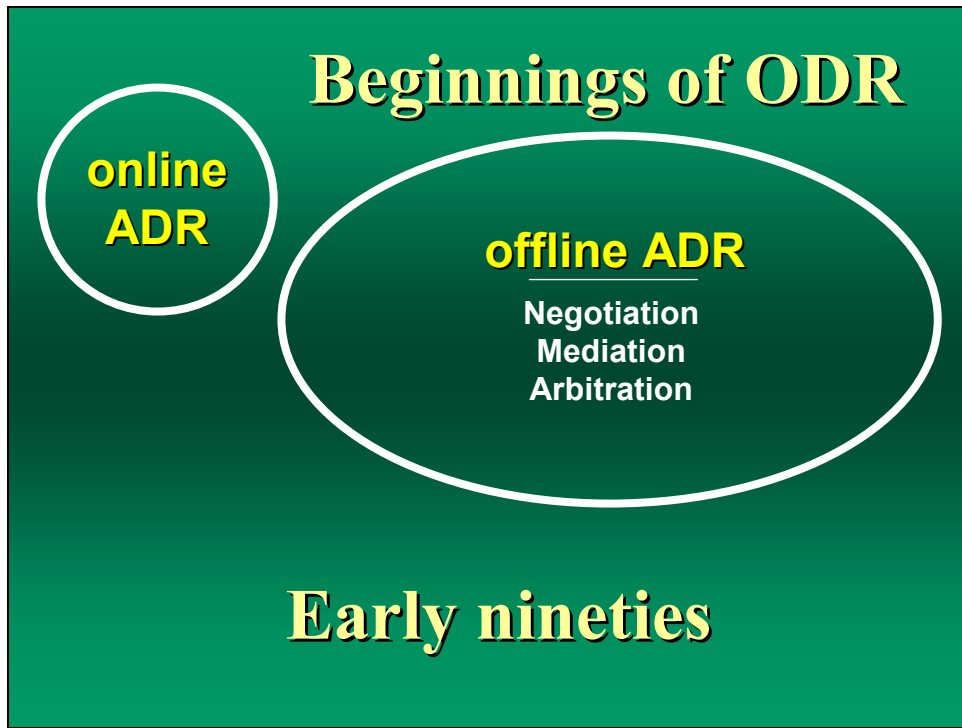
When did *Mobile ODR* begin? At the time of writing, not a single reference to this term could be found on the entire Internet. The best we could determine is that the Greeks were the first to try it. If you look carefully at following image, you'll notice that those guys actually seem to be carrying briefcases.



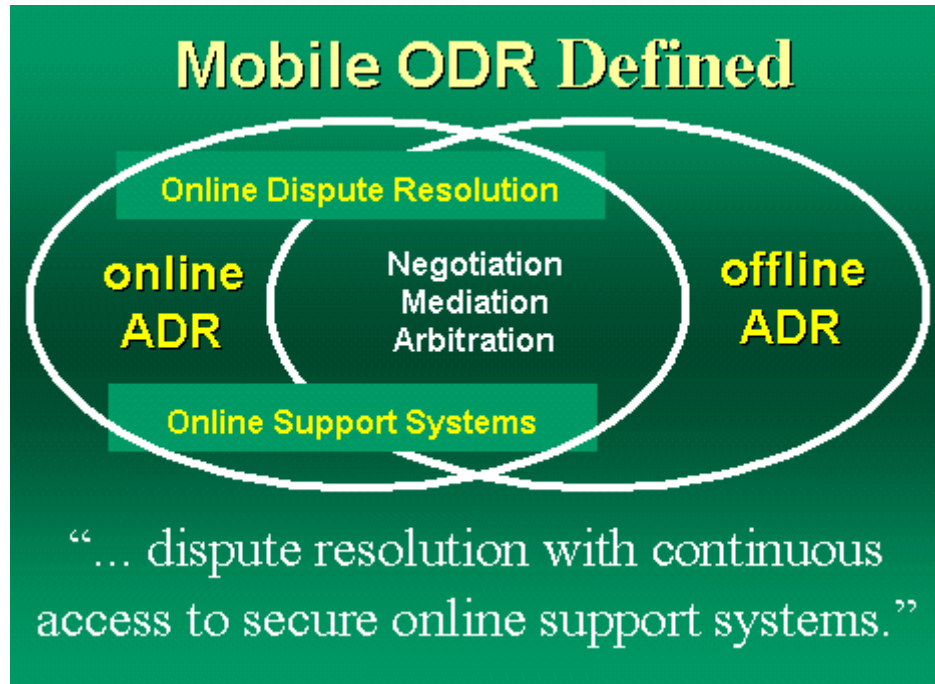
A first attempt at Mobile ODR

In truth, the Trojan Horse incident is an example that really belongs at the bottom of the dispute resolution list, which isn't even ADR, let alone *Mobile ODR*. Somewhat closer to the present, before *online* existed, ADR was simply negotiation, mediation and arbitration. When *online ADR* appeared in the early nineties (Katsh & Rifkin, 2001; Rule, 2002), what used to be simply ADR, needed to be redefined as *offline ADR*.

As *online ADR* matured, it also expanded to overlap with *offline ADR* and has since come to be known simply as ODR. Much of ODR is still strictly online, but the best of both worlds is ODR that gives parties all the flexibility and mobility offered by continuous access to the Internet with the option of a warm handshake at the end.



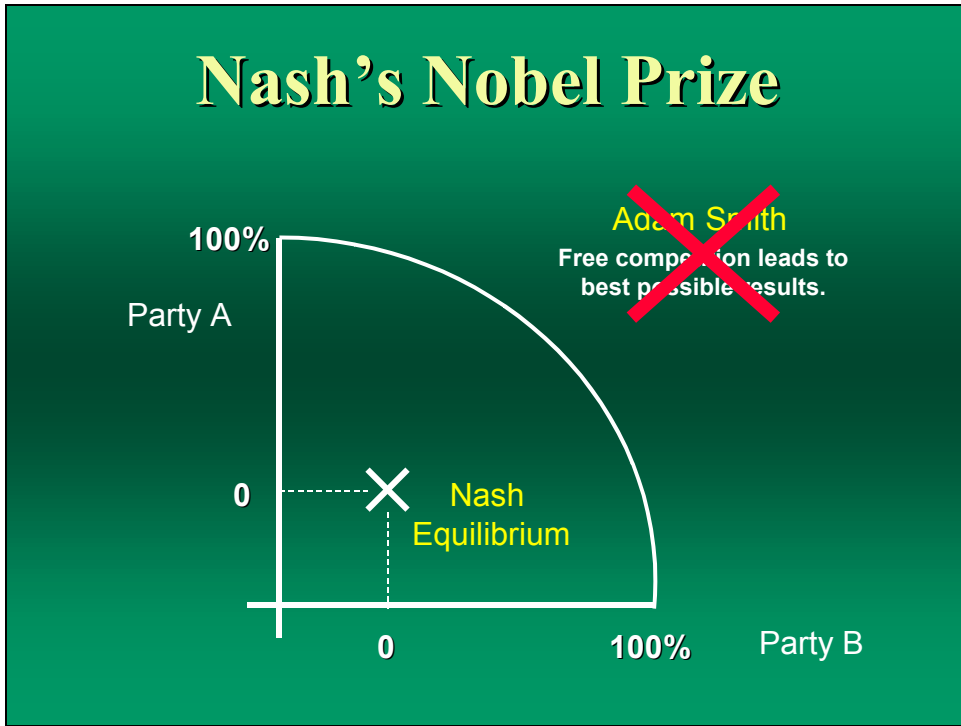
Inspired by wireless networking we are defining this as *Mobile ODR*, i.e., “dispute resolution with *continuous* access to secure online support systems”; excluding only ADR that is strictly offline.



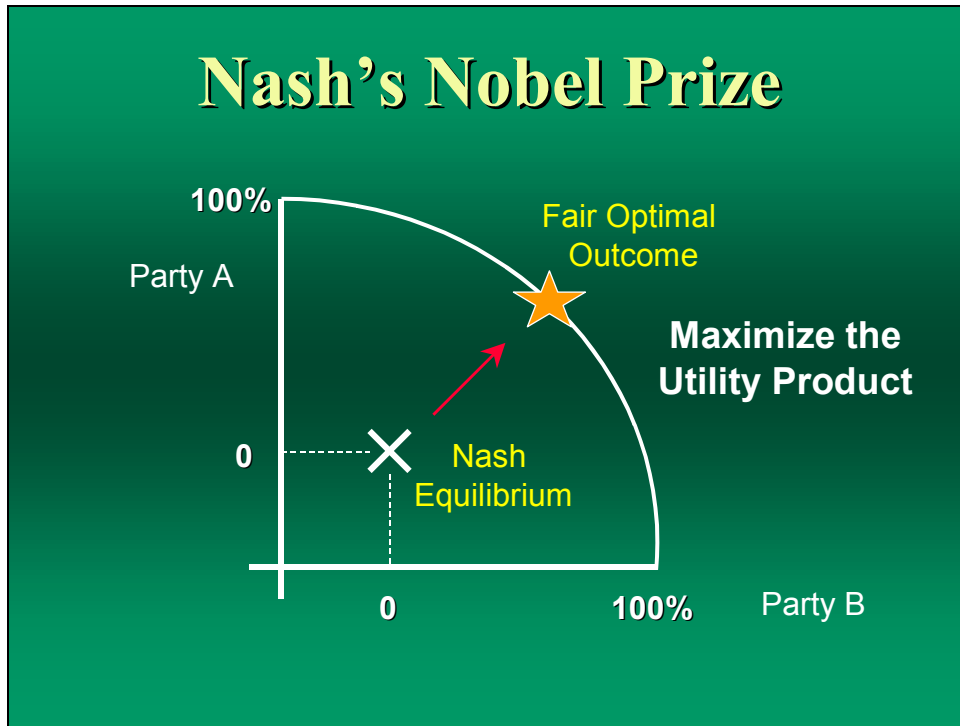
Motivation

“Peace cannot be kept by force. It can only be achieved through understanding.” (Albert Einstein, 1875-1955).

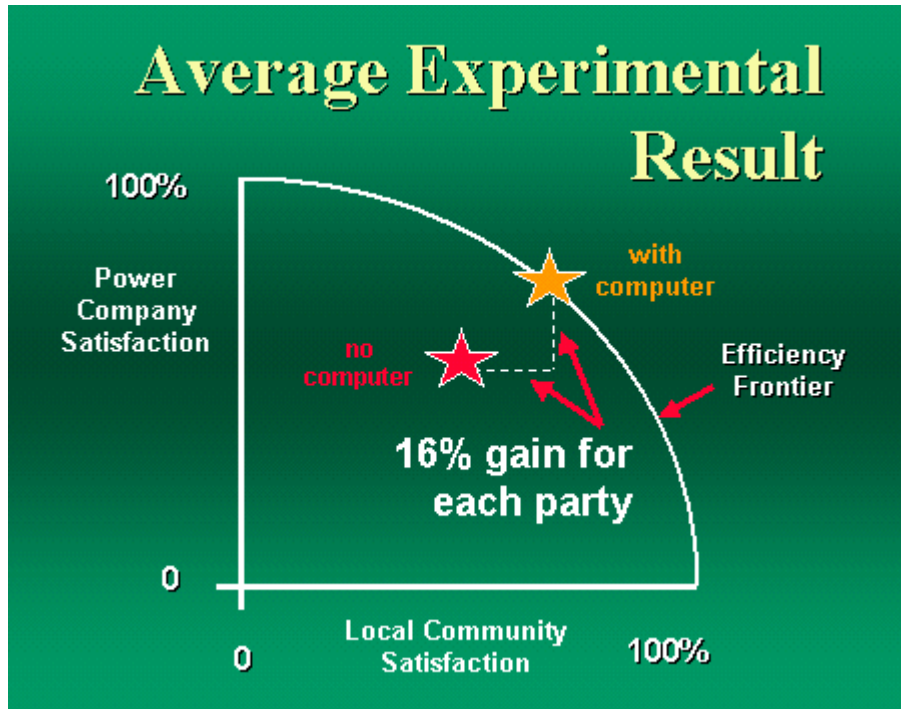
John Nash was a brilliant mathematician who attended Princeton University at the same time as Albert Einstein. Nash did some impressive things with numbers that computers could not match, and he has now been given wide recognition for work on the problem of solving complex disputes with negotiation. Nash’s research in the 1950s resulted in a 1994 Nobel Prize in Economics. In his most widely known work, Nash (1950 a, 1951) said that, *without cooperation*, conflict leads to a non-optimal equilibrium. This non-optimal equilibrium has come to be known as the *Nash Equilibrium*, challenging prevailing classical economic theory based on the ideas of Adam Smith who said that it was *free competition* that led to best-possible results.



Nash wasn't satisfied with proving that the status quo is inefficient. His next challenge was to show how we could move from the Nash Equilibrium to an optimal solution. In another paper, Nash (1950 b) said that, *with cooperation*, negotiators could achieve a fair optimal solution by *maximizing the utility product*.



Since Nash, there have been several other methods proposed for deriving fair optimal outcomes. One of these methods, preferred by some experts in the field (ICAN Systems Inc., 2002), is *Maximize the Minimum Gain*. Research at Cornell (Thiessen & Loucks, 1992) using this method to measure the difference between the “non-optimal equilibrium” and the “fair optimal solution” predicted 16% gains for negotiators under certain conditions.



Other researchers (Raiffa, 2002; Zeleznikow & Bellucci, 2003) have since predicted similar potential gains. The basic theory behind these algorithms can be illustrated with some simple illustrations of situations where parties have different preferences (Thiessen, 2001) but implementation for practical application has been a challenge that has eluded researchers for decades. The Achilles' heel preventing widespread implementation and benefit from Nash's ideas was the requirement for cooperation.

Solutions

"Nash's theory requires that the negotiators be rational and have accurate knowledge of the 'tastes and preferences' of the other. SmartSettle brings this to the real world of negotiation by providing a secure neutral site online, rather than expecting negotiators to behave so cooperatively" (Munn, 2002).

The simplest implementation for *Mobile ODR* in the context of a complex multivariate multi-party conflict is conventional peer-to-peer communication. Unfortunately, negotiations in this situation often suffer from lack of cooperation and run up against a number of barriers to effective communication. As a result, peer-to-peer tends to be adversarial, tedious, inefficient, costly and insecure; not a good solution for ODR.

Effective and secure ODR requires a neutral site server, which can host a powerful computer with the ability to handle bigger problems more quickly. More importantly, the neutral site can also securely manage all the confidential data, and because a neutral site can be truly neutral, parties are more willing to use it. Inefficient direct communication is greatly reduced and the potential for cooperation is enhanced.

A recent analysis (Tyler & Bretherton, 2003) counted 76 ODR sites on the Internet, although less than half of these are still active⁸. Most of these are known as web-based ODR since they have very thin clients requiring nothing more than a browser on the client end. At the other end of the spectrum are ODR solutions that require the installation of a client application independent from the browser. These ODR systems are said to have *Fat Clients*.

There is much debate these days about the pros and cons of *Thin Clients vs Fat Clients* (Comcorp Online, 2003). Which is preferable depends on the application. For the purposes of ODR, we see more advantages with the *Fat Client/Server* architecture. While very thin clients have the advantage of requiring smaller client capacity and shorter setup time, the *Fat Client/Server* architecture, such as that implemented with SmartSettle, offers a number of other advantages. It is faster once installed because less information needs to be transmitted. Since more of the work can be done on the client, the *Fat Client/Server* solution is more scalable, meaning more simultaneous users are possible. A higher grade of encryption is possible when not dependent on a browser, enabling stronger security. Browser encryption strengths range from 40-bit to 128-bit SSL. SmartSettle transmissions are protected with 168-bit encryption, which is billions of times more secure. User control of their own data adds even more security.

A more sophisticated and user-friendly interface and therefore comprehensive solution is also possible by means of the *Fat Client*. With SmartSettle's seamless "online update" feature, users are always up to date. If desired, they can override the default and choose for themselves which components or functionality to update. And last, but not least, contrary to intuition, fatter clients are even more mobile. Once a case is created on the neutral site, it can be accessed from anywhere there's an Internet connection. However, users are not dependent on a continuous connection and are not stranded when the connection dies. They can travel anywhere and retain full local functionality, regardless of the existence or quality of the Internet connection.

The challenges for *Mobile ODR* are essentially the same as those for wireless networking; i.e., limited range of hot spots, limited available spectrum on the airwaves (Mark, 2003), security (sydistykmofo, 2003), cost (Brown, 2003), and slow user acceptance. As a result, ODR networks today are still mostly wired, but the day is coming soon, when parties will be free of these wires with a high quality connection to the Internet wherever they go.

Example with SmartSettle

This example takes place in Canada. It extrapolates a real-world supply agreement negotiation (ICAN, 2003 b) a short time into a hypothetical *Mobile ODR* future that may well be reality by the time this book hits the shelves. The Internet is available wirelessly from virtually anywhere as predicted by Ericsson (2002). Worldwide, there are 30 million laptops or Tablet PCs equipped with Wi-Fi capability that regularly use this network (Intel President Les Vadasz prediction, October 2002).

⁸ <http://www.ombuds.org/center/onlineadr.html> is a list of active websites viewed 2003 June 12.

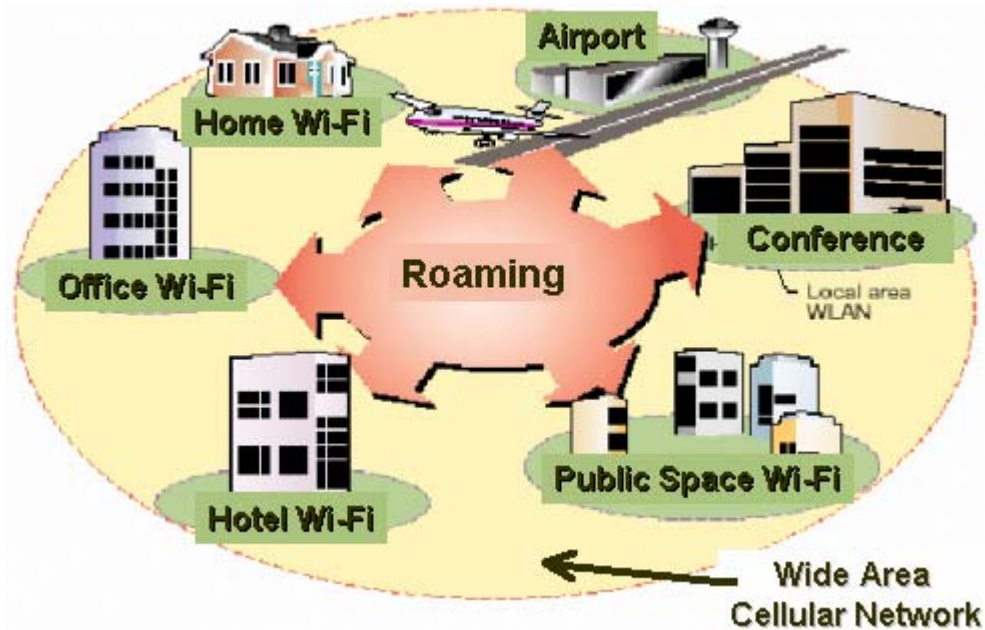
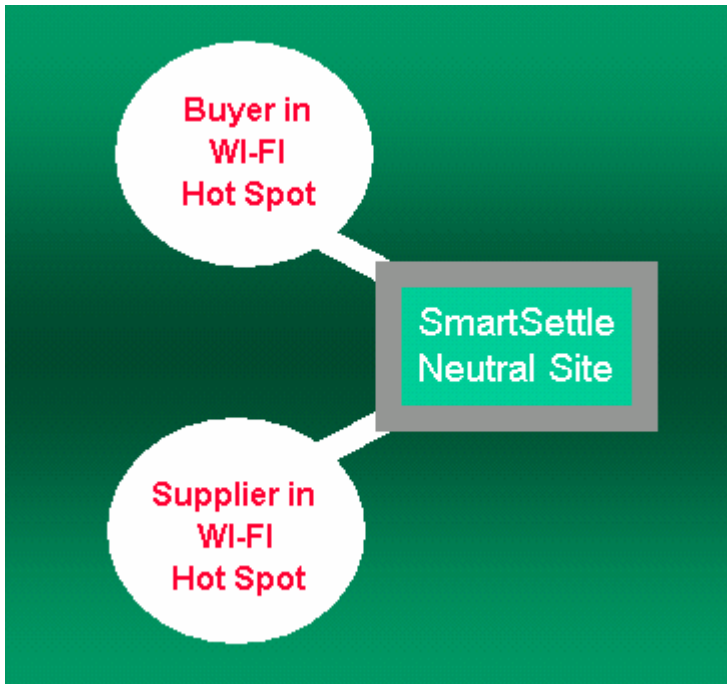


Illustration adapted from Ericsson (2002)

Each of the parties in our negotiation has one of these Tablet PCs. Their Tablet PCs weigh less than 3 pounds and are equipped with built-in Wi-Fi, which make them very convenient. Not only are our negotiators each located in their own private hot spot, but wireless hot spots also abound in a multitude of restaurants, cafes, libraries, airports and train stations. Their Tablet PCs can be carried around an office complex with the ease of a clipboard. If going a little further, it is a simple matter to toss it into a briefcase. The world is literally at their fingertips wherever they go.

These Tablet PCs also feature a good size display that is amazingly clear, even in bright sunshine. With plenty of RAM and hard drive space, and a processor that responds in the blink of an eye, these Tablet PCs give the user access to a wide range of powerful applications, including SmartSettle. An optional full-size keyboard that connects via USB is handy when working in the office. However, when out and about, our decision makers use a built-in stylus, which works much like a mouse. A lithium-ion battery keeps a solid charge, even with constant use for much of the day.



One of our mobile decision makers, whom we shall refer to as Supplier, is the manager of a modern industrial complex in Toronto that manufactures various steel products in eastern Canada and delivers to all regions of Canada. One of Supplier's products is steel strapping, made in various sizes and used mainly in industrial applications to band items together during shipment. For steel strap, Supplier has only one Canadian competitor, also located in the Toronto area.

Buyer in our scenario is an operator of a sawmill in the BC interior. Buyer requires steel strap to band together finished lumber before shipment to customers by railcar. With the steel strap, Buyer also needs "seals" (that clamp together the two ends of a band of strap) and cardboard "edge protectors" (that are placed under the strap to prevent damage to the lumber). Without steel strap Buyer could not ship any lumber to customers.

Because of the historic duopoly on the supply side of the steel strap market, most buyers tend to stay with one supplier through many contracts. Such is the case here: Buyer has used incumbent Supplier for the past four years, is satisfied with his product quality and service levels. There have been few disputes along the way and these have usually been resolved satisfactorily over the telephone. The parties have met face-to-face once a month to maintain personal contact and resolve occasional difficulties.

At present, our two decision makers are less than one year into a three-year contract and a dispute has arisen about the minimum size of a product order. When Supplier returns Buyer's call, she tells him about a new eNegotiation system named SmartSettle that they have just used in another negotiation with surprising benefits for both parties. Supplier explains that SmartSettle is much more than dispute resolution and, after a brief discussion, Supplier persuades Buyer to try out the system.

Rather than simply resolve their dispute over the one issue raised by Buyer, they agree to take full advantage of SmartSettle and reopen all the variables in their existing agreement. Both parties are comfortable with this action midway through a contract because they also agree that either party has the right to revert to the current agreement for any reason. In other words, the contract will be revised only if each party sees the SmartSettle solution as better for themselves; a true win-win requirement.

To get started, each party privately defines their respective objective. Buyer's objective is to minimize the total cost per shipment of lumber. The key drivers of Buyer's objective are:

- ❖ the length of the contract in months (term);
- ❖ total volume purchased and the unit purchase prices for the various line items;
- ❖ the cost to negotiate the contract (set-up cost);
- ❖ the internal cost to place an order (transaction cost);
- ❖ the cost to receive and handle each delivery (transport cost);
- ❖ the carrying cost of holding inventory (in turn dependent of the average inventory held and the annual % carrying cost); and
- ❖ the length of time the supplier allows the buyer to defer paying for each delivery (accounts payable benefit).

From her perspective, Supplier wants to maximize her long-term profit (long-term meaning for numerous sequential contracts rather the next quarter or year). She also recognizes, however, that a focus solely on absolute profit would tend to sacrifice "profit per unit" in favour of a longer contract term. In essence, she needs to balance absolute profit and "return on sales". (profit as a percent of sales). Supplier's key drivers therefore are:

- ❖ the length of the contract in months (term);
- ❖ total volume purchased and the unit purchase prices for the various line items;
- ❖ the cost to negotiate the contract (set-up cost);
- ❖ the internal cost to receive an order (transaction cost);
- ❖ the cost to deliver the materials (transport cost);
- ❖ the carrying cost of holding inventory; and
- ❖ the length of time the supplier must wait after each delivery to receive payment from the buyer (accounts receivable cost).

Some of the drivers are common to both parties, some are unique. In aggregate, they are the variables the two parties will need to agree on for the new contract:

- ❖ the length of the contract in months (term);
- ❖ total volume purchased and the unit purchase prices for the various line items;
- ❖ the cost to the Buyer to negotiate the contract (Buyer's set-up cost);
- ❖ the cost to the Supplier to negotiate the contract (Supplier's set-up cost);
- ❖ the internal cost to the Buyer to place an order (Buyer's transaction cost);
- ❖ the internal cost to the Supplier to receive an order (Supplier's transaction cost);
- ❖ the Buyer's cost to receive and handle each delivery (Buyer's transport cost);

- ❖ the Supplier's cost to deliver the materials (Supplier's transport cost);
- ❖ the Buyer's carrying cost of holding inventory (in turn dependent of the average inventory held and the annual % carrying cost);
- ❖ the Supplier's carrying cost of holding inventory; and
- ❖ the length of time the supplier allows the buyer to defer paying for each delivery (a/p and a/r cost or benefit).

Buyer and Supplier next meet face-to-face to create a Framework for Agreement, which is in the form of a final agreement with blanks to represent the aggregated decision variables in their negotiation. A facilitator who will work primarily with Buyer in this negotiation attends the initial meeting. Supplier, having just completed a different negotiation with SmartSettle, is confident about her own ability to operate the system without much outside assistance.

The parties have agreed to use their existing agreement as a basis from which to create the Framework for Agreement. Buyer's facilitator comes to the first meeting with a draft of this document. Altogether, about twenty decision variables are identified. The parties discuss possible outcomes for these issues and define preliminary bargaining ranges. This discussion also identifies several single-issue outcomes that had not been previously considered. Buyer's facilitator explains that including these options tends to "expand the pie" and create opportunities for joint gains.

Following this meeting, each party creates an economic model in which their own private objective is calculated from the decision variables. They build these models privately using SmartSettle's satisfaction graphs to capture the real-world non-linearities and interdependence of the variables, something they were unable to do in their traditional spreadsheet economic models. They also use an intuitive method of fine-tuning tradeoff specifications called Even Swaps to help them become more confident that SmartSettle is adequately representing their preferences.

Buyer and Supplier test and refine their models by entering multiple solution scenarios and seeing how well SmartSettle is representing their preferences. For commercial security during these activities, SmartSettle provides a private information area that is inaccessible to the other party.

With their respective economic models working well within SmartSettle, they are ready to begin negotiations. Our parties agree that each of them will begin with an optimistic proposal, i.e., more than they expect to achieve from this exercise. After that, parties are free to use any of several functions available to SmartSettle users (explanations of which are available in greater detail on the SmartSettle website (ICAN Systems Inc., 2003 a):

- ❖ Conventional proposals
- ❖ Reflections (proposals simplified as satisfaction ratings)
- ❖ Suggestions (a form of multivariate blind bidding)
- ❖ Equivalentents (a type of Suggestion useful when parties are close to an agreement.)
- ❖ Improvement (for optimization after an agreement has been reached)

After the initial productive face-to-face meeting, our negotiators physically part ways but they are still in contact with each other. It happens that each of our decision makers have new video conferencing equipment in their boardrooms. Although it still isn't the same as being in the

same room, the quality of audio and video is very good compared to a few years ago and our negotiators use video conferencing for a few brief follow-up meetings to clarify various things in the Framework for Agreement.

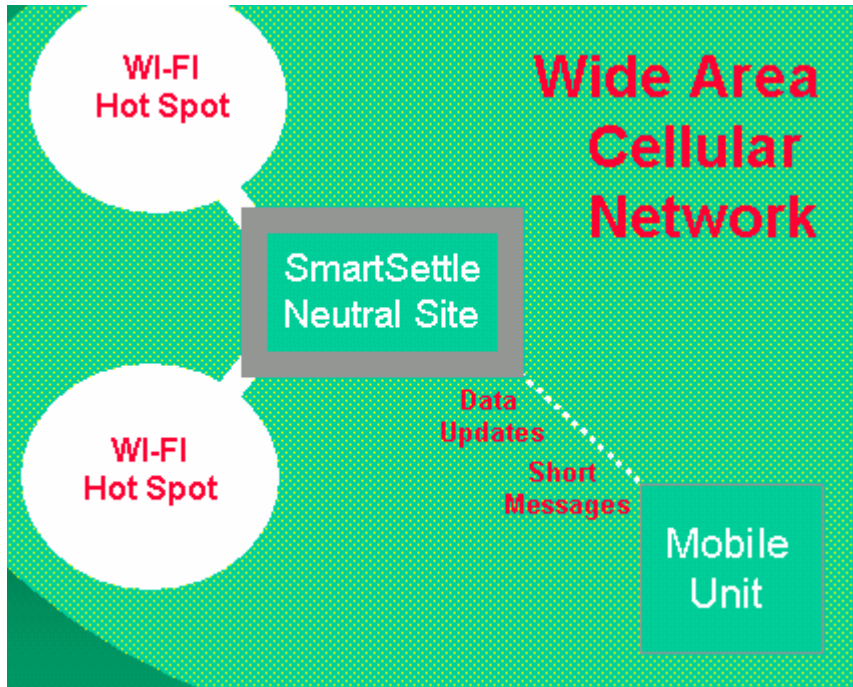
Supplier, being more experienced, is ready first and offers the first proposal. Buyer receives this before he is finished analyzing his own preferences within SmartSettle. The next day, on her way to the airport, Supplier's mobile phone beeps. She is out of range of Wi-Fi but SmartSettle has been instructed to notify her on her mobile phone. It's an SMS text message⁹ from SmartSettle. There is a counter proposal waiting from Buyer. There is enough information in the message to let Supplier know that the proposal from Buyer is not as extreme as she was expecting.

Supplier has some time to spare and decides to stop by at a Wi-Fi hot spot on the way to the terminal to check it out. She opens up her Tablet PC and synchronizes with the SmartSettle server. As expected, Buyer's formal proposal fits well within the bargaining ranges prepared by Supplier. Although encouraged by this healthy concession relative to previous discussions, Supplier is not ready to accept Buyer's latest proposal and decides to request suggestions from SmartSettle. SmartSettle, aware of each party's objective functions without revealing them to the opposite party, is able to suggest to both of them simultaneously several alternative solutions. On the surface, each of these suggestions may appear as a compromise between Supplier's initial proposal and Buyer's counter proposal. However, as SmartSettle considers joint preferences of the parties, SmartSettle suggestions are actually better than mere compromise. Supplier considers these suggestions and tells SmartSettle that she is willing to accept some of them.

Buyer is automatically notified that there now are changes waiting for him to look at. Buyer happens to be spending a leisurely week up at the cabin. With accurate notification and reliable access to what is going on at the office, even when at remote locations, Buyer has recently started enjoying the luxury of spending longer periods away.

⁹ SMS is an acronym for Short Message Service further defined at <http://www.devx.com/wireless/Door/11311> viewed 2003 July 21.

Out of reach of any Wi-Fi hotspot, Buyer's Tablet PC automatically switches over to a WAN (Stone, 2003). WAN Internet access is slower and more expensive but this is of little consequence to the SmartSettle *Fat Client*, which is optimized to exchange the minimum amount of information with the server. Buyer only needs to be online a short time to update the information, after which he can study it at his leisure offline.



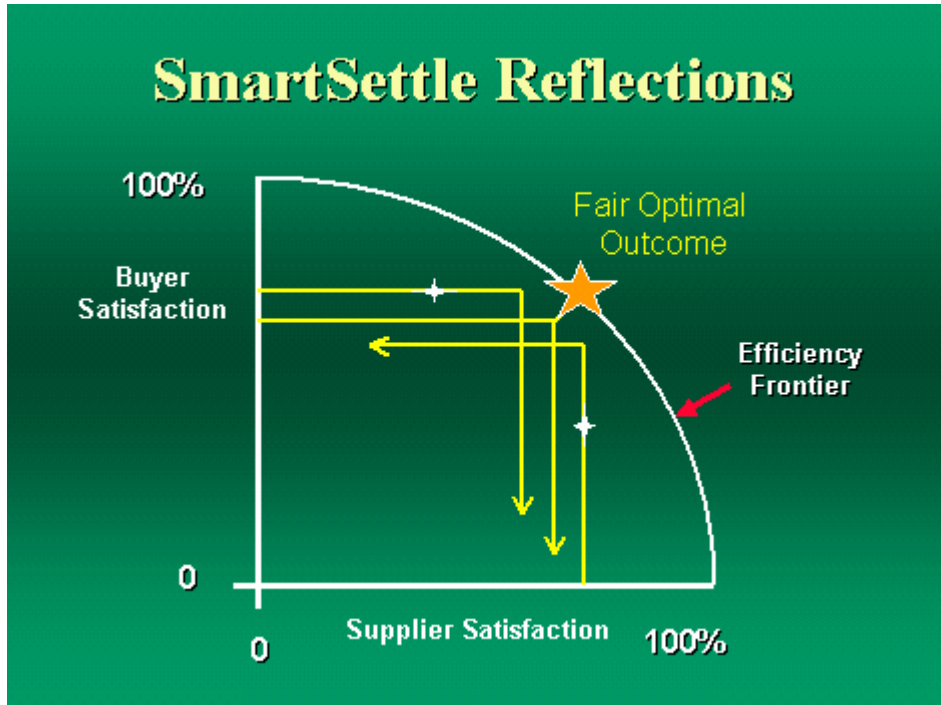
After Buyer considers the suggestions generated by SmartSettle, he also accepts some of them. If both parties would accept the same Suggestion, they would have reached a tentative agreement. However, since this hasn't happened yet, at Supplier's suggestion, the parties agree to use SmartSettle's Reflection mode.

In Reflection mode, a party first identifies a package that is acceptable to themselves. When this package is "reflected", rather than showing the original package to the other party, SmartSettle assesses all solutions and identifies an "optimal" solution, i.e., one that would deliver the highest possible satisfaction to the other party while maintaining the satisfaction level of the originator's proposal. The satisfaction value of that potential optimal outcome (a single number) is then revealed to the other party. If acceptable to the receiving party, the optimal outcome is revealed to both parties. In essence, the original proposal is "reflected" off the efficiency frontier.

An implication of the Reflection functionality for *Mobile ODR* is that, with preferences well represented, parties can actually respond to a proposal while on the road using a very simple single-number interface. Other advantages of this method are that there are fewer steps to the final outcome and that final outcome also tends to be more efficient.

In this case, Buyer and Supplier simultaneously "reflect" their latest acceptable proposals. A response from Buyer produces a tentative agreement when Supplier accepts it. The tentative

agreement is subsequently optimized and both parties are pleased with an outcome that is significantly better than the agreement that they had at the beginning of their negotiations.



After this happy conclusion of negotiations, Buyer and Supplier each pause to assess what SmartSettle has achieved. Buyer sees that his satisfaction, as rated by SmartSettle according to his personal objective model, has risen from 57 for his old agreement to 75 under the new agreement; an increase in satisfaction of 32%¹⁰. He feels he has done well for his company. What Buyer doesn't know is that Supplier has done the same comparison. In Supplier's objective model, her satisfaction has risen from 950 under the old arrangement to 1124 under the new, an increase of 18%. Smiles all around confirm a true win-win result.

How was it possible to achieve these joint gains? In effect, SmartSettle analyzed all the decision variables to determine where a relatively small sacrifice by one party was able to deliver a more valuable gain to the other. Many of the variables were juggled, some in favour of Buyer, others in favour of Supplier. For instance, Buyer's objective model reflected a lower cost of capital than Supplier but a higher cost of clerical labour. SmartSettle suggested that Buyer pay for each shipment as soon as possible while Supplier take on more of the labor of placing/receiving an order (perhaps by using a browser to access Supplier's orders generated inside Supplier's procurement system).

In a traditional negotiation, neither party would have revealed their cost of capital or their clerical labour cost. Under the original contract negotiated without SmartSettle, the opportunity to trade off small sacrifices for bigger gains was not recognized and potential joint gains were left on the table.

Summary

Mobile ODR is a new term that aptly characterizes dispute resolution in a new wireless world where everyone is connected to the Internet wherever they are. Many ODR vendors are taking advantage of this new mode of communication by setting up neutral sites with client/server architectures. One important distinction among ODR systems is the size of the client, varying from thin browser-only clients to *Fat Clients* with fully independent applications on the client end.

This paper shows that ODR systems like SmartSettle with Fat Client/Server architecture have distinct advantages, the most important of which is the ability to put negotiators in control of a flexible and convenient process that quickly produces good outcomes. Lack of cooperation among decision makers is identified as a significant obstacle that can be mitigated with the use of a very secure and trusted neutral site that can manage confidential preferences and generate outcomes that are both fair and efficient. The paper concludes with an example of the application of Mobile ODR with the SmartSettle system, which implements such a neutral site. In a negotiation between a buyer and a seller of steel strap, SmartSettle Mobile ODR helps two busy executives collaborate in turning a dispute over one issue into an opportunity to significantly increase the value of their agreement by optimizing decisions for all the variables in their existing agreement. The example demonstrates that SmartSettle allows faster, more convenient and more effective collaboration that can minimize the value left on any negotiation table.

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¹⁰ These percentages are representative of the results from a few simulations with a situation based on a real case familiar to the authors. The subjects in these uncontrolled simulations were asked to set their own scales and aspirations. The reader is cautioned against using these numbers to predict benefits in real cases.

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