

BREXIT 2.0 Negotiation Simulation with Smartsettle Infinity™

*Peter Holt, Graham Ross, Ernest Thiessen & Diana Wallis**

1. Summary

Guided by trained facilitators, the United Kingdom, the European Union Member States (EUMS) and the EU Parliament collaborated in resolving seven key BREXIT issues in a simulated negotiation with the help of a sophisticated system called Smartsettle Infinity. A model of the problem was built with preferences of the parties that were deduced from public information on the Internet. The final phase of the negotiation was played out in fast-forward at the 2018 Liverpool ODR Conference, where attendees were invited to engage from the point of view of the EUMS, while the other two parties were played in the background by intelligent robots.

Optimistic proposals were exchanged at the beginning of a process called Multivariate Visual Blind Bidding, which requires negotiating parties to create proposals as complete packages, so that all issues can be negotiated simultaneously. Well-represented confidential preferences analyzed by Smartsettle's neutral site produced semi-optimal suggestions for consideration. Overlapping secret acceptances quickly produced a baseline agreement. Further examination uncovered remaining hidden value in order to generate an Improvement that was worth even more to each party.

2. Smartsettle Infinity Challenged to Resolve BREXIT

Invited by the organizers of the ODR conference at Liverpool's recent International Business Conference to demonstrate Smartsettle Infinity's ability to encourage collaboration and solve complex disputes, the Smartsettle team just couldn't resist BREXIT. Their mission was to resolve BREXIT during a one-hour conference session. To accomplish this admittedly tall order, a new hypothetical scenario was created called BREXIT 2.0, which was simplified to a small number of key issues. The team imagined three parties that would be involved in the negotiation, the United Kingdom, the EU Parliament and the EUMS. The EU was split into two parties to reflect the fact that not all members agreed wholly with

* Peter Holt is Chief Product Development Officer at iCan Systems Inc. Graham Ross runs a distance training course on ODR for mediators and arbitrators at www.odrtraining.com and he is a member of the Civil Justice Council ODR Advisory Group. Ernest Thiessen is President of iCan Systems Inc of British Columbia, developers of the Smartsettle eNegotiation and visual blind bidding system. Diana Wallis is Former Vice-President of the European Parliament, past President of the European Law Institute and former Director of the International Mediation Institute.

the EU negotiators' approach and that their views would need to be taken into account if the final agreement was to be ratified. For the simulation, one team member assumed the role of facilitator, while the other three were each assigned to one of the three parties.

Smartsettle Infinity is an application that does what human minds alone cannot manage; it models the dispute, manages preference information, negotiates all issues as a package and optimizes solutions. Infinity supports an unlimited number of quantitative or qualitative issues between any number of parties in any combination of real-time and asynchronous negotiations, whether face-to-face or between remote locations. The technology is hosted at a secure neutral site where parties' behaviours are transformed from adversarial to collaborative.

The Smartsettle Infinity process requires parties to develop a Single Negotiating Framework (SNF). Building the SNF is a joint exercise in which the parties agree on the issues to be negotiated and the range within which a suitable outcome likely exists. The SNF for BREXIT 2.0 was developed prior to the conference and presented to the audience as a handout. The following list shows the issues that were addressed. Included (in uppercase) are two derived issues (Issue 3 and Issue 9), which allowed a more precise representation of party preferences.

- 1 Amount of the separation payment to be paid by the United Kingdom:
 - Range £20–£70 billion (*preference covered by issue 3*)
- 2 The period over which the separation payment would be paid:
 - Range 12–120 months (*preference covered by issue 3*)
- 3 Separation payment present value¹
 - Range: £20–£70 billion
- 4 Customs Union Options: *Options are as follows:*
 - UK Remain in CU
 - UK-CU Bespoke Deal
 - UK leave CU-Ireland Maximum Facilitation
 - UK leave CU-No Deal
- 5 Rights of EU and UK citizens currently resident in the United Kingdom and the EU: *Options are as follows:*
 - Current UKEU resident's rights preserved
 - Aligned to new UKEU reciprocal resident's rights agreement
 - Current UKEU resident's rights preserved for 20 years
 - Current UKEU resident's rights preserved for 10 years
 - No special privileges for UKEU residents
- 6 Irish land border issues: *Options are as follows:*
 - All Ireland Customs Union
 - UK match EU tariff post 2020
 - Soft border for Industrial Goods and UK/Irish Citizens using Tech
 - Soft border for Industrial Goods using Tech
 - Hard border controls

1 Each party specified their own private discount rate in order to derive present value as a function of the amount of the separation payment (Issue 1) and the period over which the payment will be made (Issue 2).

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- 7 Access to single market for industrial goods:
 - Range 0%–100%
- 8 EU tariff to be imposed for industrial goods access:
 - Range 0%–25%
- 9 EU revenue from proposed EU tariff on UK industrial goods:²
 - Range: £0–£14 billion/year
- 10 Passport regulatory equivalence transition
 - 1 year
 - 2 years
 - 3 years
 - 4 years
 - 5 years
 - Ongoing

Once the issues are identified and agreed and the ranges established, parties define any constraints that should be shared between all the parties. An example would be that if the United Kingdom agreed to be part of the Customs Union, the Irish border issue would no longer be an issue. A shared constraint would link the two issues, so that they could not be in conflict such as UK part of the Customs Union and border controls.

Following the establishment of shared constraints, parties may create private constraints that apply only to their own preferences and strategies. The other parties have no visibility of a party's private constraints.

Each party defines how it would become satisfied with respect to each of the issues being negotiated. Parties must assign a relative importance to each issue. In some cases, issue importance is specified indirectly with derived issues. The specified level of importance (preference) to the party is the difference in satisfaction that would result from the most and least preferred outcomes for that issue. Therefore, the most preferred outcome on an issue valued at 20 would be worth twice as much as the most preferred outcome on an issue valued at 10.

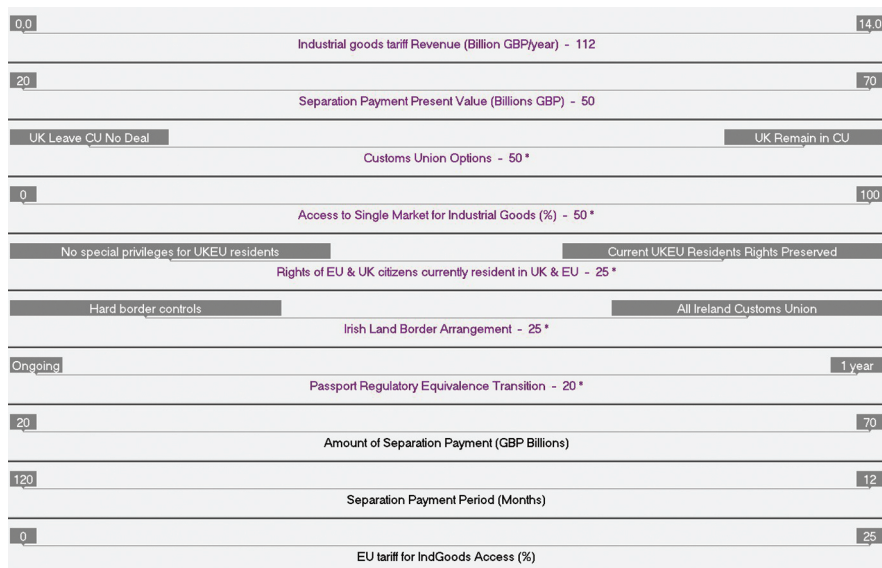
The Infinity user interface presents the user with a horizontal bar graph for each issue. A package of issue values (either numerical values or options) can be displayed on the interface and adjusted with sliders. As the slider is moved along the bar, the issue value changes, as well as the amount of satisfaction contributed from that value to the overall satisfaction of a package. The default is to arrange the negotiating range for each issue, so that the most preferred value is on the right-hand side. As a result, each party's view of the problem is particular to its own preferences.

The audience was asked to imagine how the three parties collaborated in creating the SNF and modelling the problem. The parties went through many iterations in which the issues evolved and preference representations were fine-tuned. The final phase of the negotiation was reached just prior to the conference session. The audience was shown the remainder of the negotiation only from the pri-

² Each party specified their own private parameters in a formula to estimate of future UK trade of industrial goods to the EU.

vate viewpoint of the EUMS. The other two parties each have their own private view in which the package ratings will be much different based on their own preferences. Following are a few screenshots of the process from the viewpoint of the EUMS.

Figure 1 *Issues with Ranges and Relative Importance Shown from the EU Member States' Perspective*



The negotiating ranges were oriented so that the EUMS preferred the values on the right-hand side of the panel (Figure 1). The EUMS have assigned a relative importance to each issue. With the given negotiating ranges, the most important issue to the EUMS was ‘Industrial Goods Tariff Revenue’ worth 112 points. The second most important issue was ‘Separation Payment Present Value’ worth 50 points. From this, one can deduce that one point is worth a billion £ ((70 – 50)/50).

The issues at the bottom of the panel are excluded from preferences because they are represented by derived issues. ‘Industrial Goods Tariff Revenue’ was derived from ‘EU tariff for Industrial Goods Access’ and ‘Access to Single Market for Industrial Goods’. Separation Payment Present Value is derived from ‘Amount of Separation Payment’ and ‘Separation Payment Period’.

Numerical example: All parties agree that the final agreed separation payment will likely lie somewhere between the values of £20 billion and £70 billion. For the EUMS, £70 billion is the most desirable. These preferences would be reversed from the UK perspective (not shown here).

Optioned example: The parties have simplified Custom Union options to four possible outcomes: UK Leave CU-No deal/UK-CU Bespoke Deal/UK leave CU-Ireland MaxFac/UK remain in CU. There could be many more options in a real-life

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negotiation. Of these options, the EUMS prefer ‘UK remain in CU’. The worst and best options from the UK perspective (not shown here) were ‘UK remain in CU’ and ‘UK-CU Bespoke Deal’, respectively.

Figure 2 EU Member States Opening Proposal



The opening proposal of the EUMS is displayed here in Orange (Figure 2). As the sliders are near the right-hand side, this package is highly desirable. The EUMS are prepared to concede relative to this position.

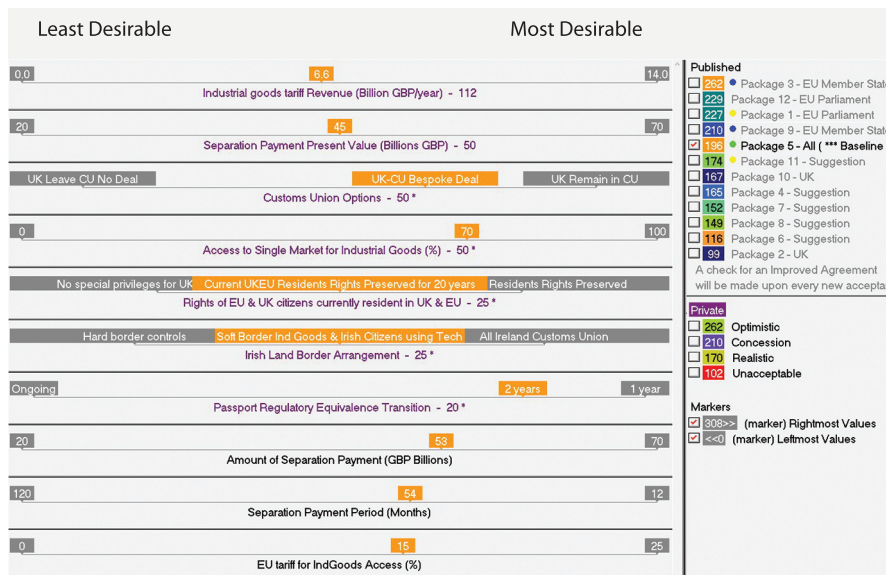
Figure 3 EU Member States and UK Opening Proposals from the EUMS Perspective



The UK opening proposal (Blue) is near the left-hand side and is, therefore, not very desirable to the EUMS compared with the opening proposal made by the EUMS (Orange) (Figure 3).

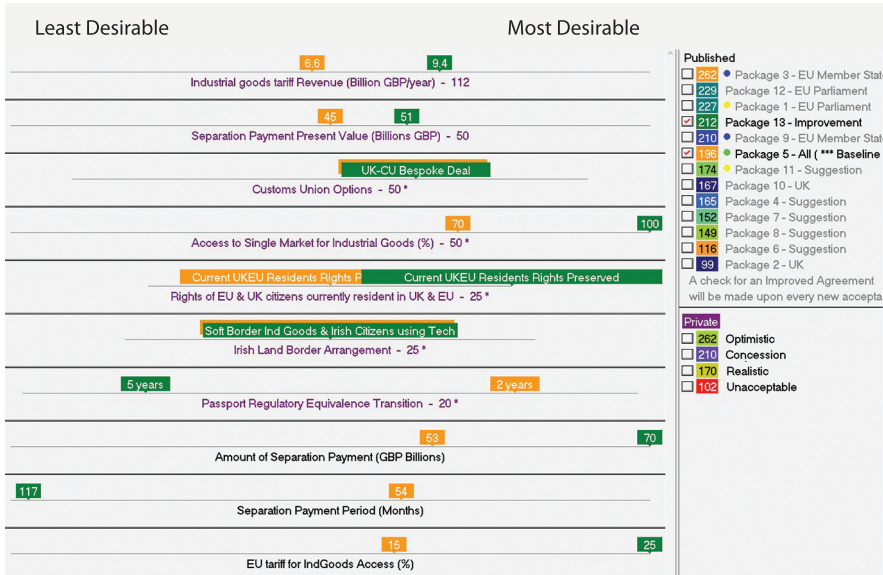
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Figure 4 Baseline Agreement Reached after Several Sessions



Numerous packages were exchanged, including suggestions generated by the system. Every package has a rating based on EUMS preferences. The package ratings are derived from the relative importance of each issue and its satisfaction function, which may be nonlinear. It can be seen from the markers that all package ratings vary between zero and at least 308. The baseline agreement (Figure 4) lying somewhat to right of centre of the ranges is worth 196 points, even better than 'Realistic' worth 170 points.

Figure 5 *EU Member States – Improvement over Baseline Agreement. Improved from a rating of 196 to 212. Orange = baseline, Green = improvement.*



Using its proprietary algorithm ‘Maximize the Minimum Gain’, Smartsettle Infinity was able to uncover hidden value and distribute it fairly among all three parties (Figure 5). To the EUMS, the Improvement was worth 16 points more than the previously agreed Baseline. Compared with their unacceptable package, this Improvement represents a 17% increase.