# A Requirements Negotiation Model Based on Multi-Criteria Analysis

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# Abstract

- Many software projects have failed because their requirements were poorly negotiated among stakeholders.

- Requirements negotiation is more critical than other factors.

- There is Win Win negotiation model which successfully supports general requirements negotiation.

- Multi-Criteria Preference Analysis Requirements Negotiation (MPARN)

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# Motivation

- Multi-criteria methodology potentially increases stakeholders' levels of cooperation and trust and providing a reasoned approach to a better negotiation process.

- The Win-Win negotiation model provides a general framework for requirements negotiation successfully.

- This is a systematic model to guide stakeholders from options to agreements using Multi-Criteria Preference Analysis Requirements Negotiation (MPARN) model.

# WinWin Negotiation Model

- The dotted lined box show WinWin Negotiation Modlel.
- The WinWin model provides a general framework for identifying and resolving requirement conflicts.
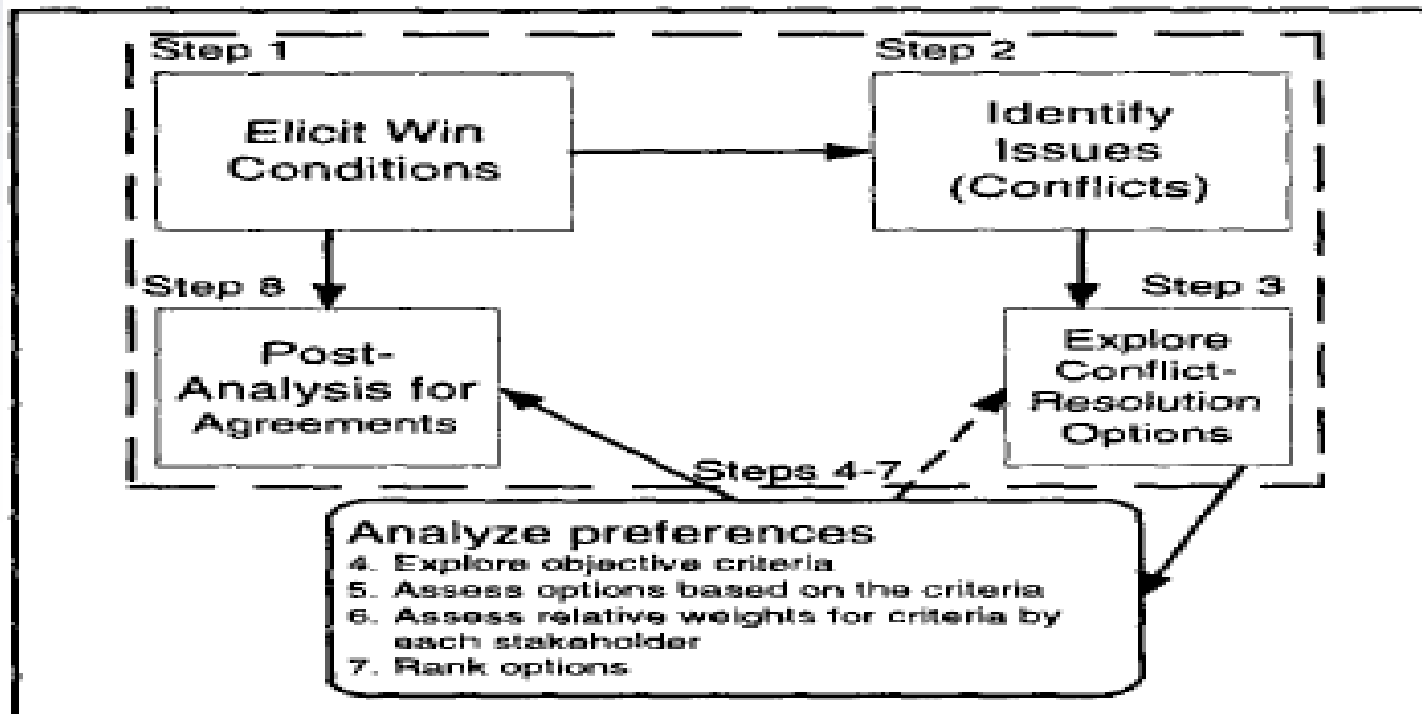
# Multi-Criteria Preference Analysis

$$Value = \sum_{i=1}^{k} w_i \times s_{ij}$$
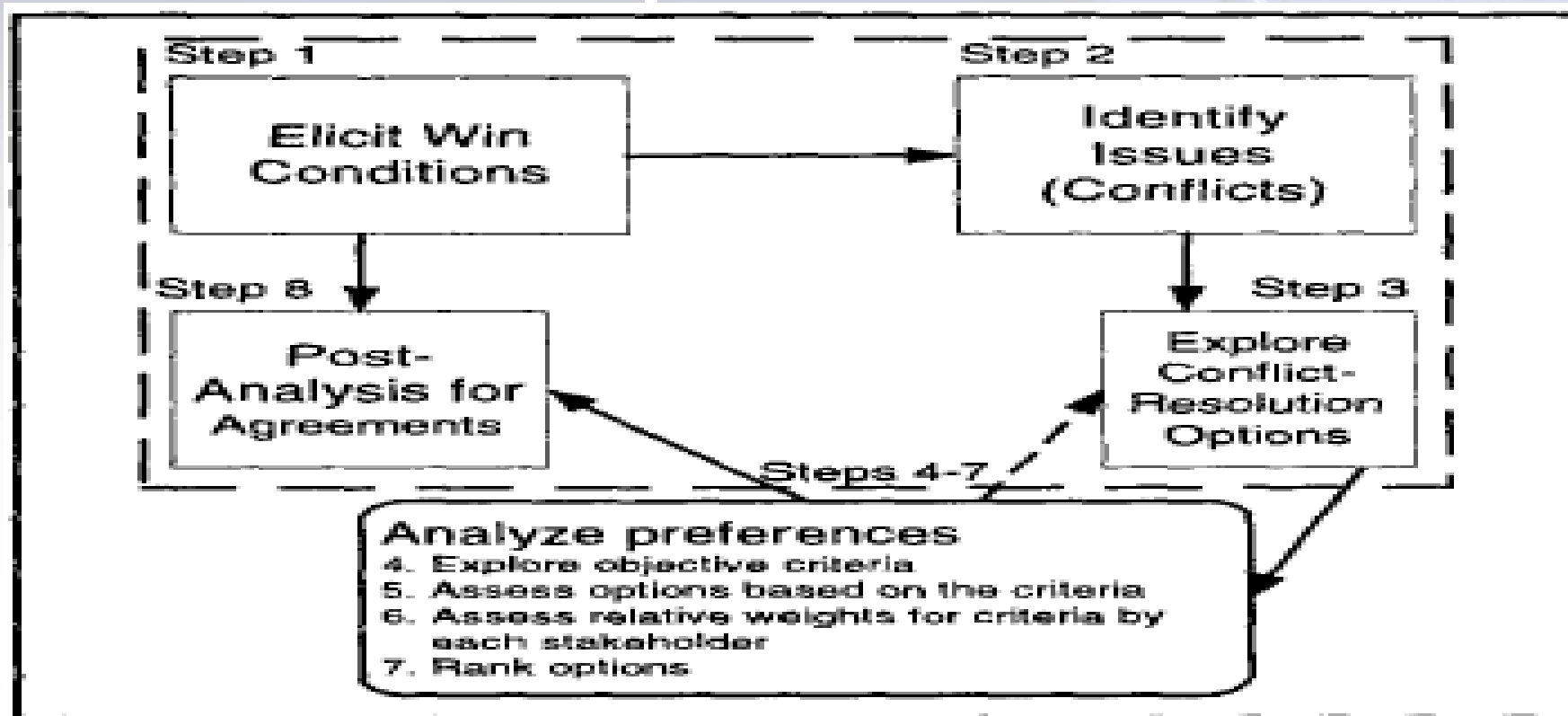
where k is the number of criteria
 j is the alternative under consideration.
The variable w, represents
the relative importance of criterion i
The variable s, represents the relative attainment of alternative j on
criterion i.

# The MPARN Process



Step 1 — Elicit Win Conditions

Step 2 — Identify Issues (Conflicts)

Step 3 — Explore Conflict-Resolution Options

Step 8 — Post-Analysis for Agreements

Steps 4-7 — Analyze preferences
4. Explore objective criteria
5. Assess options based on the criteria
6. Assess relative weights for criteria by each stakeholder
7. Rank options

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# The MPARN Process STEPS:

- Step 1: Elicit Win Conditions
- Step 2: Identify Issues (Conflicts)
- Step 3: Explore Conflict-Resolution Options
- Step 4. Explore Objective Criteria
- Step 5: Assess Options based on the Criteria
- Step 6: Assess Relative Criteria Weights by Stakeholder
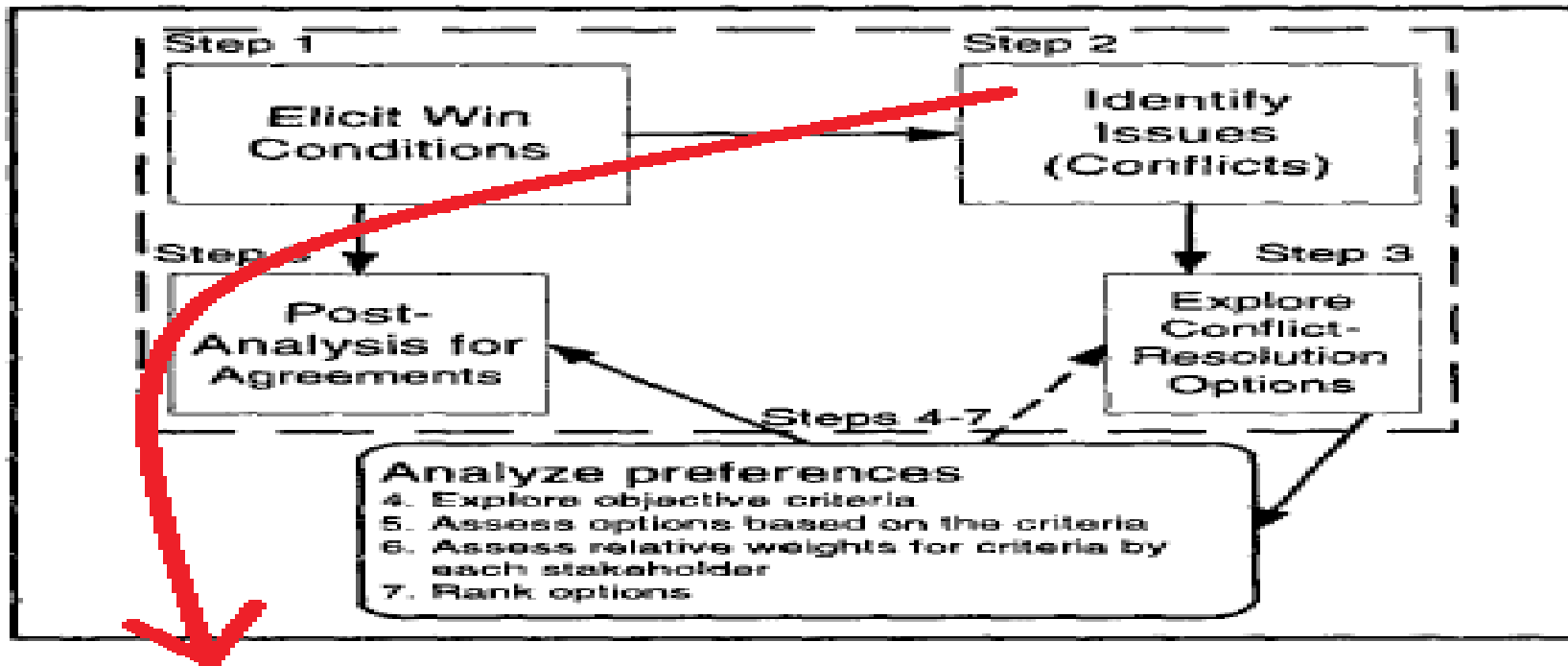- Step 7: Rank Options
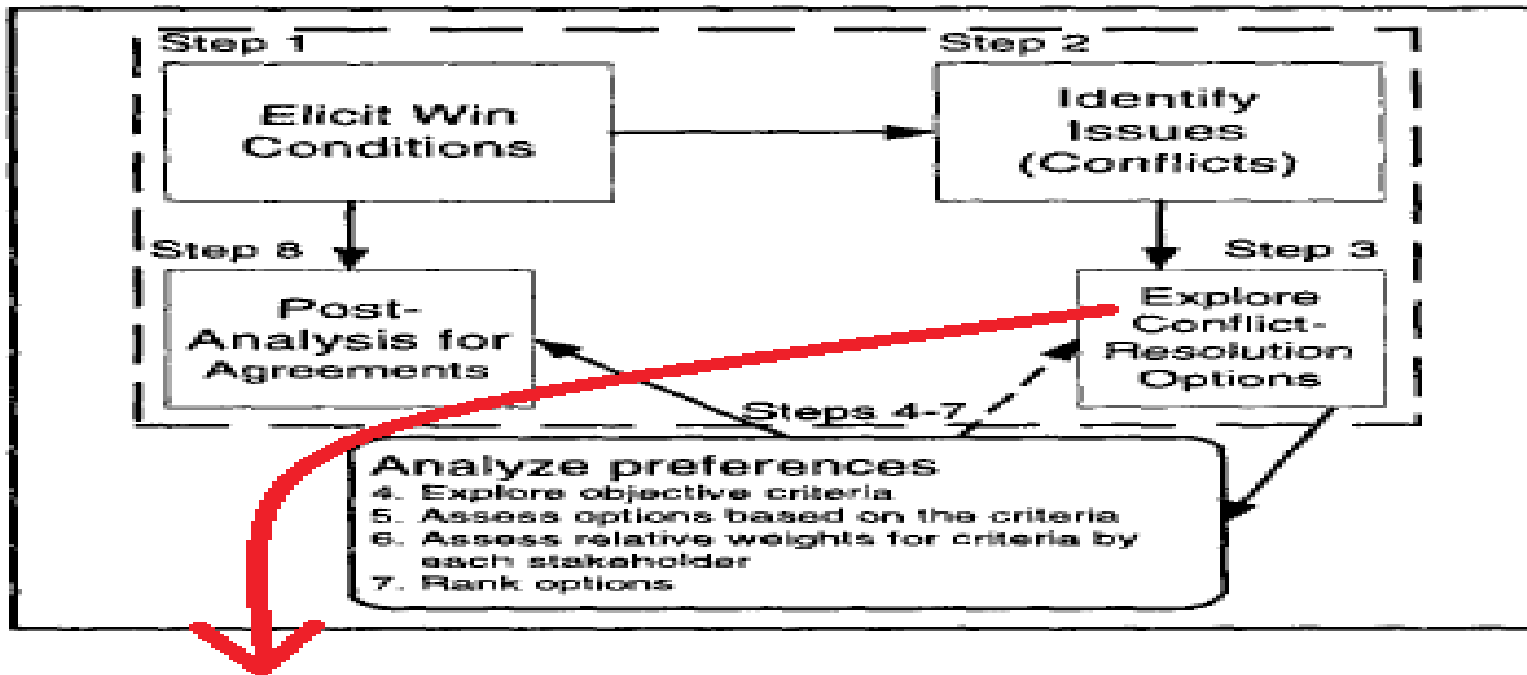- Step 8: Post-Analysis for Agreements

# Step 1: Elicit Win Conditions
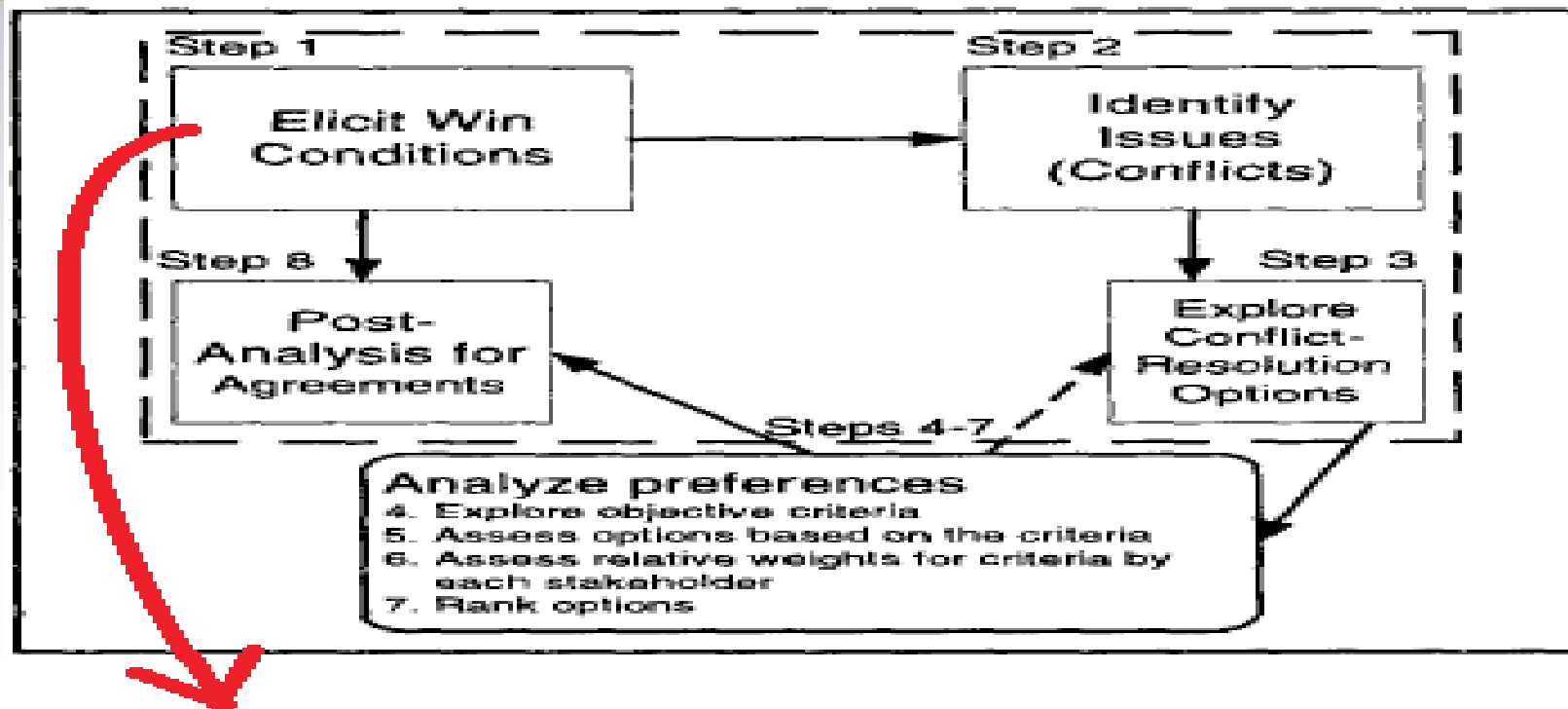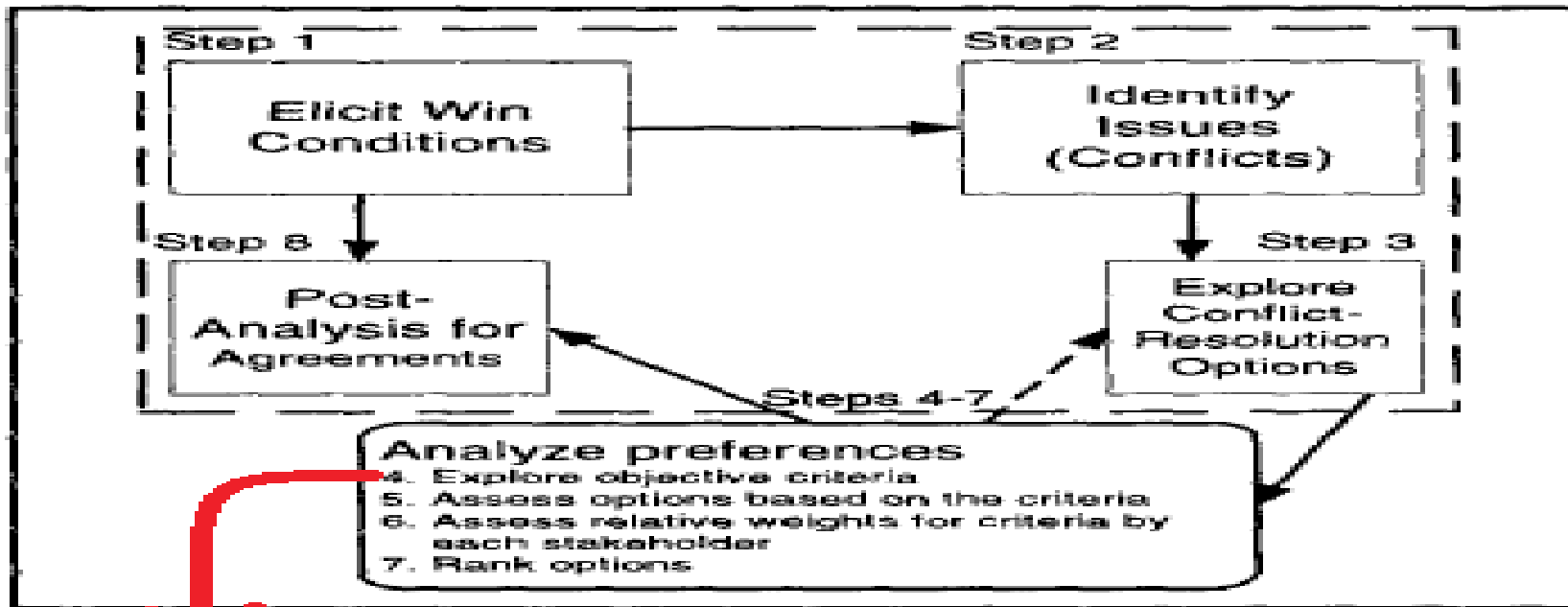


- presents the WinWin negotiation.

**For each issue, stakeholders prepare candidate option schemas addressing the issue**

- **finding a best solution to a disagreement among them.**
- **Mutual satisfactory.**

**...hat are considered highly important to the other stakeholders.**

# Step 5: Assess Options based on the Criteria



- Step 1 — Elicit Win Conditions
- Step 2 — Identify Issues (Conflicts)
- Step 8 — Post-Analysis for Agreements
- Step 3 — Explore Conflict-Resolution Options
- Steps 4-7
- Analyze preferences
  4. Explore objective criteria
  5. Assess options based on the criteria
  6. Assess relative weights for criteria by each stakeholder
  7. Rank options
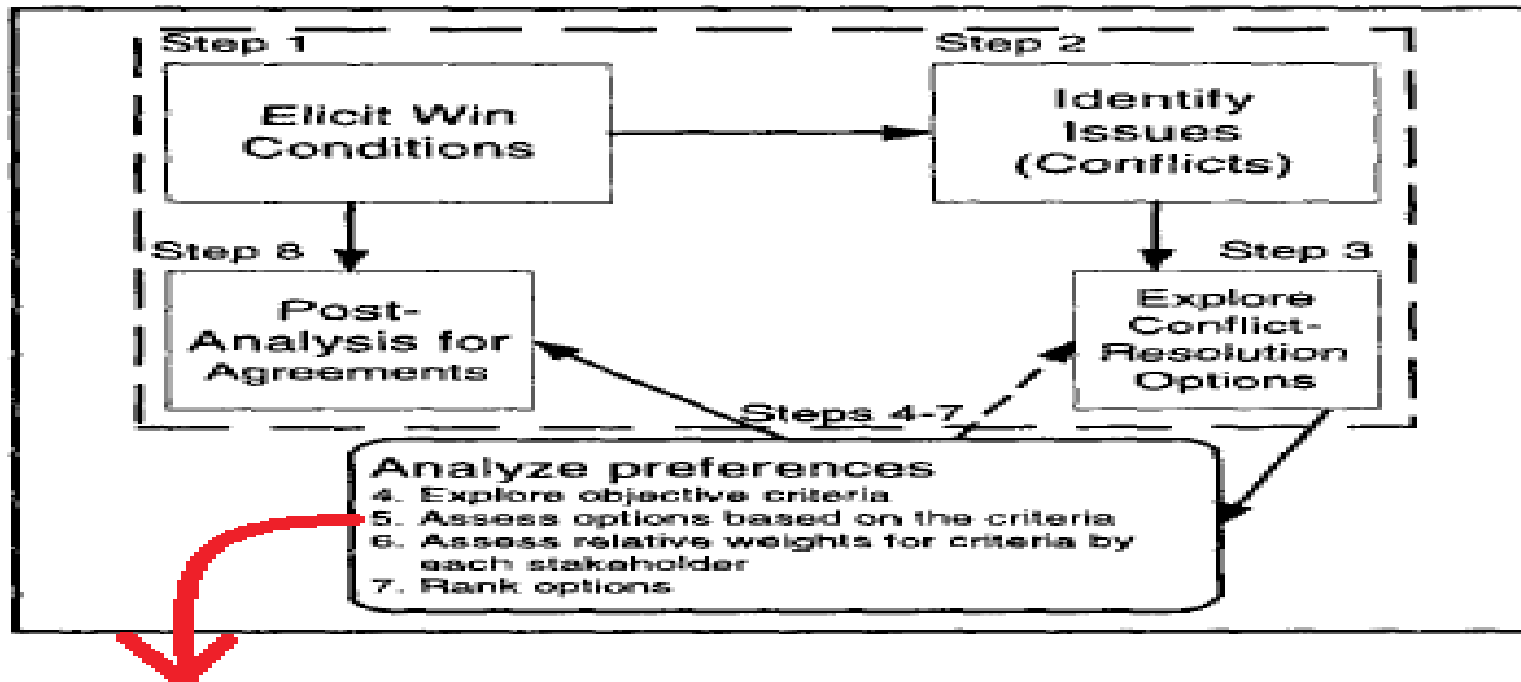
- **Once this list of criteria is developed, each stakeholder assesses each option's performance.**

# Step 6: Assess Relative Criteria Weights by Stakeholder
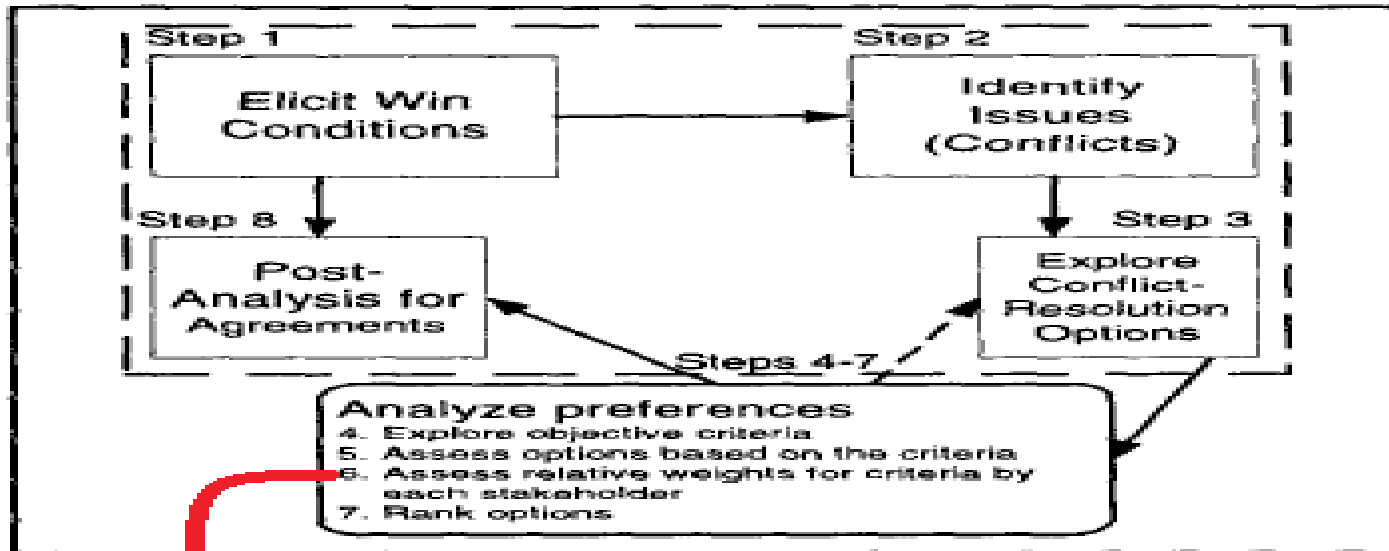


- Step 6 is to obtain relative weights for criteria by each stakeholder. As with value scores, there are many ways to do this. For example,

1. Direct subjective evaluation 2. Ratio pairwise comparison

3. A geometric progression

# Step 7: Rank Options



Step 1
Elicit Win Conditions

Step 2
Identify Issues (Conflicts)

Step 8
Post-Analysis for Agreements

Step 3
Explore Conflict-Resolution Options

Steps 4-7

Analyze preferences
4. Explore objective criteria
5. Assess options based on the criteria
6. Assess relative weights for criteria by each stakeholder
7. Rank options
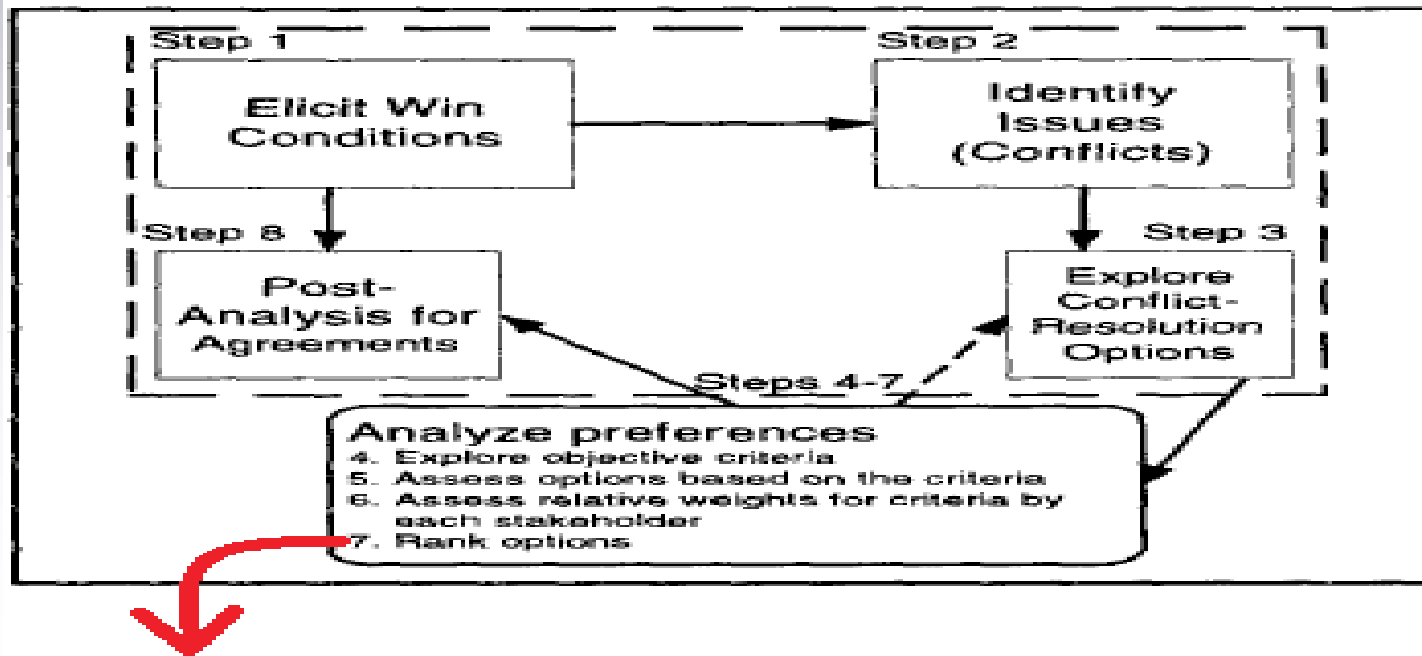
- **The priority steps are provided.**

# Step 8: Post-Analysis for Agreements
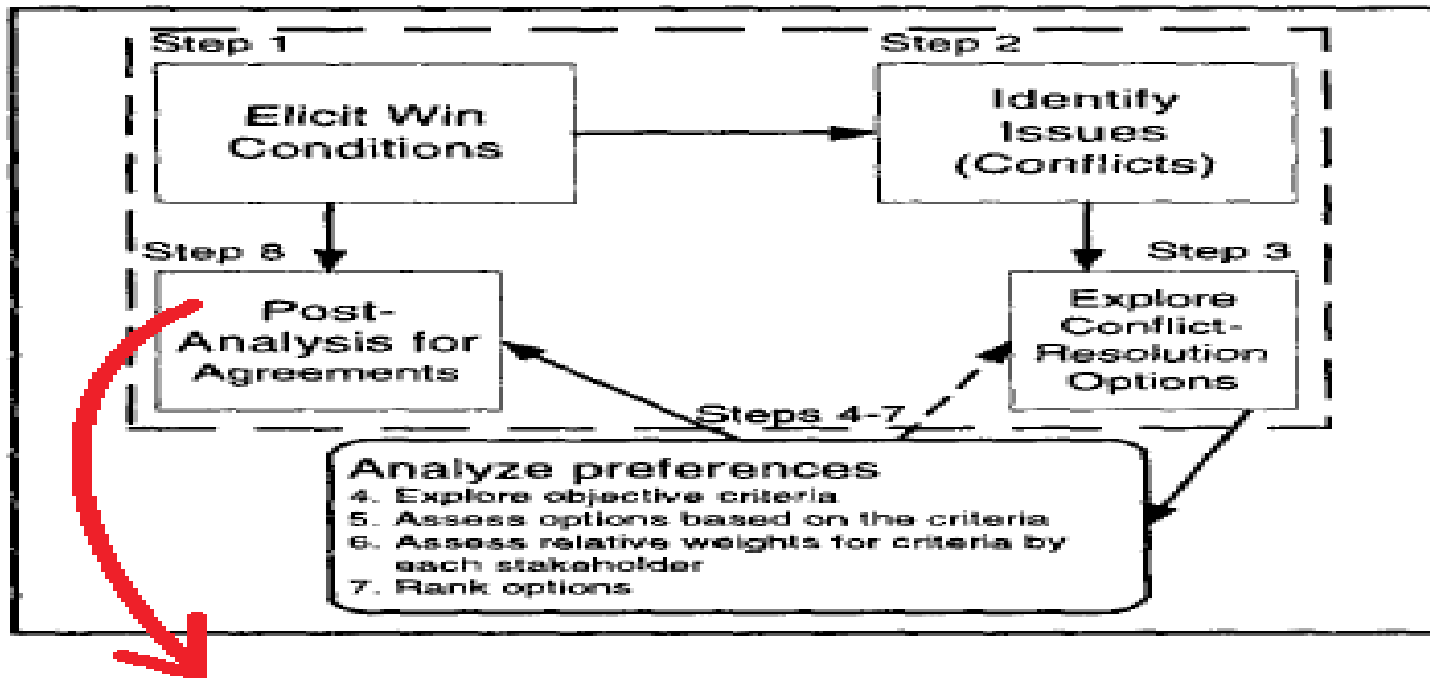


- **Satisfied Solution posted.**

# Further Research Challenges

- The MPARN approach offers useful tools to aid the stakeholder negotiation process.
-  Option generation and negotiation planning

- Criteria exploration and objective assessment for option score and criteria weight.

- Systematic post-analysis for agreement and graphical Support

# Thank You