# Interrelationship Diagram (Network Diagram)

**Problem**
How to determine the most important problem factors?
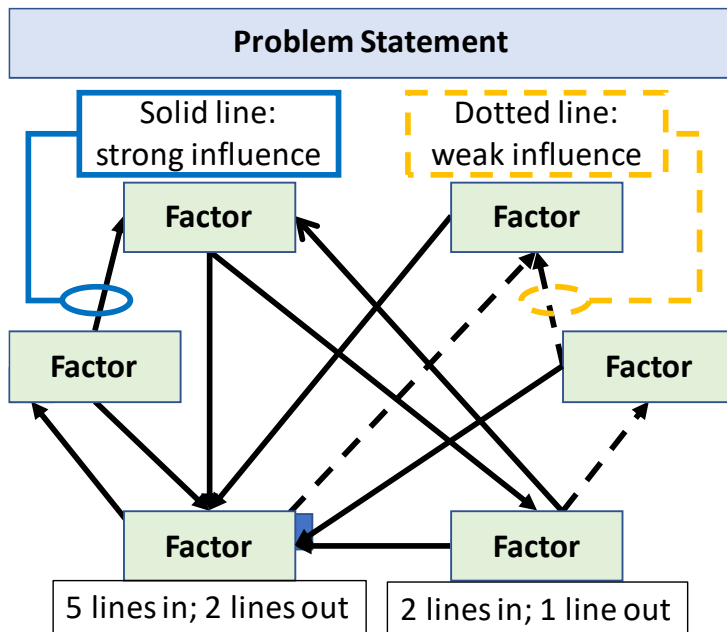
**Difficulty**
Easy to use

- An **Interrelationship Diagram** (ID) shows the cause and effect relationship among different factors.
- The factors are connected by arrows, tail is a driver and head is an effect.
- An ID finds key factors by counting the number of in and out arrows.

Many root causes → **Interrelationship Diagram Process** → Most important root causes



Problem Statement

Solid line: strong influence

Dotted line: weak influence

Factor

Factor

Factor

Factor

Factor

Factor

5 lines in; 2 lines out    2 lines in; 1 line out

1. Define the problem statement to explore.
2. Use brainstorming to identify the key factors (or root causes).
3. Lay out the diagram, with each key factor placed around a circle.
4. Put arrows on the diagram
   - For each pair of factors A and B, ask "Does A influence B?". If "yes," then draw an arrow from A to B (a solid arrow for strong influence, a dotted arrow for a weaker influence). Repeat for "Does B influence A?".
5. Count the number of arrows going in to, and out of, each factor.
   - Optional: weight dotted arrows as ½.
6. The most important factors are the one with the most lines in or out.

# Interrelationship Diagram – Example – Attrition

**Problem to address:** *Why are employees quitting?*

**Step 1:** "Employees are quitting"
**Step 2:**
- "Disagreements with manager"
- "Explore other job opportunities"
- "Limited growth opportunities"
- "Want less travel"
- "Want more salary"
- … (for a realistic analysis, many more factors would be included)
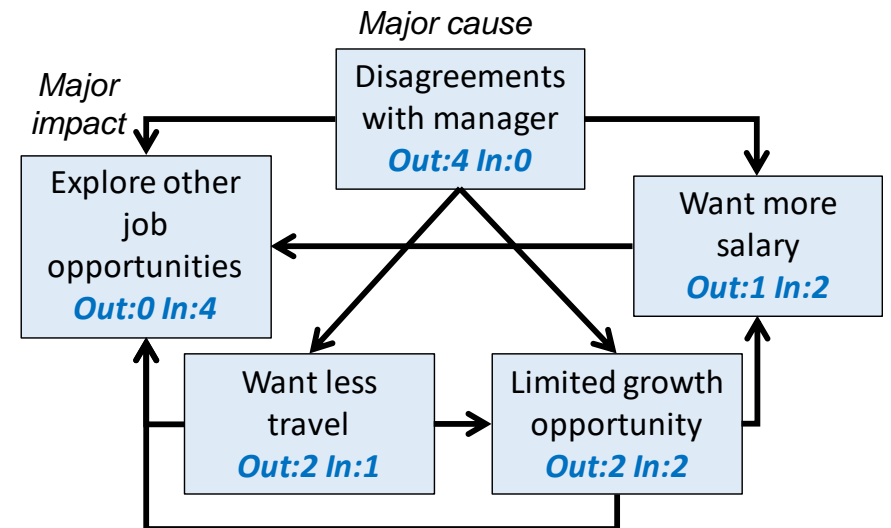
**Steps 3 & 4:** see figure (top)
**Step 5:** see figure (bottom)
**Step 6:** Conclusions
- **Major cause (most out arrows):** "Disagreements with manager"
- **Major impact (most in arrows):** "Explore other job opportunities"
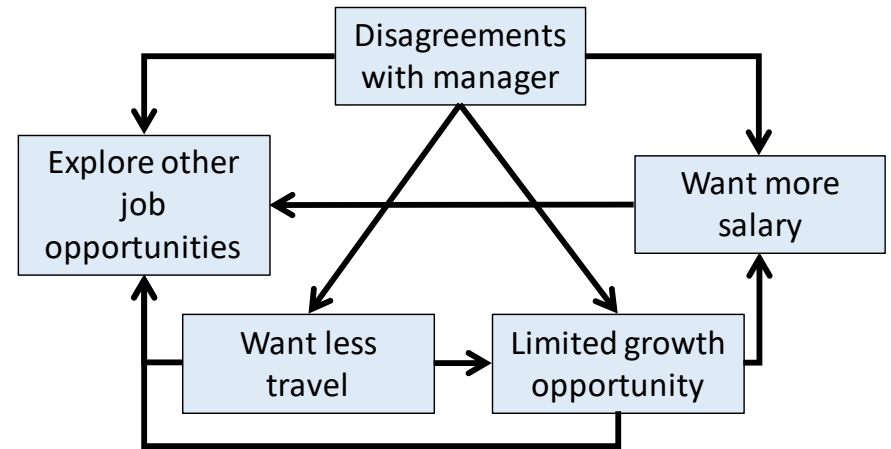


**Steps 3&4 (above), Step 5 (below)**

# Interrelationship Diagram – Notes

## Slide 1

1. Creating an ID helps a team identify a complex problem's logical relationships and create a common understanding.
2. An ID can clearly and concisely communicate a problem's relationships .
3. An ID can be used to better understand and identify root causes.
4. An ID helps identify which factors are causing problems and which are an outcome of other factors.
5. An ID can quantify and prioritize the strength of each factor. Hence, it can find the factors having the largest improvement impact.
6. An ID can better explore the problem space after creating a fishbone diagram.

## Slide 2

Here are some tips for creating an ID:
- Keep the factors simple (few words)
- Ensure that the relationships between different factors are clear.
- Document, for later review/updating, why a specific link/arrow was created, and what assumptions are behind it.
- Obtain the advice of a SME when assigning different values to solid and dotted lines.