



**STRATEGYFINDER
ANALYSIS TOOLS
MANUAL (v1.2)**

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Strategyfinder – Analysis Tools

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Introduction to Analysis Tools – their use

Most of the analysis tools can be explained to participants and so used in real-time during a workshop.

In this manual the layout shows:

- the purpose of an analysis tool is discussed – why it would be used
- what the analysis does
- how to do the analysis

Analyses and Uses with *Strategyfinder* Methods

***Strategyfinder* - Systemic Risk Management**

Systemic risk models typically focus on the role of feedback loops and so finding potent loops and potent risks to mitigate in the loops.

***Strategyfinder* - Stakeholder Analysis and Management**

Stakeholder analyses typically focus on the model representing a social network between individuals and organisations, and so the analysis will make use of centrality analyses: ins/outs, betweenness, closeness. Influence and dependency range analyses are also particularly useful.

***Strategyfinder* - Discover and Exploit Competitive Advantage**

Discovering competitive advantage focuses on the relative uniqueness of a network of competences. Thus the analysis considers the nature of the network: feedback, clusters (centrality),

***Strategyfinder* - Team Strategy Finding: a 1-2 day workshop – to develop a first draft of a strategy**

Strategy making typically uses all of the analysis tools. Feedback is particularly significant – where vicious cycles need to be stopped and virtuous cycles exploited. Hierarchical potency is also very useful.

***Strategyfinder* - Team Solutionfinder: a 2 hr workshop – ad hoc to work on a complex/messy problem**

For solution finding hierarchical potency is usually the most powerful analysis tool, alongside dependency and influence range analyses.

***Strategyfinder* - Conflict Management**

Dependency and influence ranges are particularly useful, alongside centrality analyses: ins/outs.

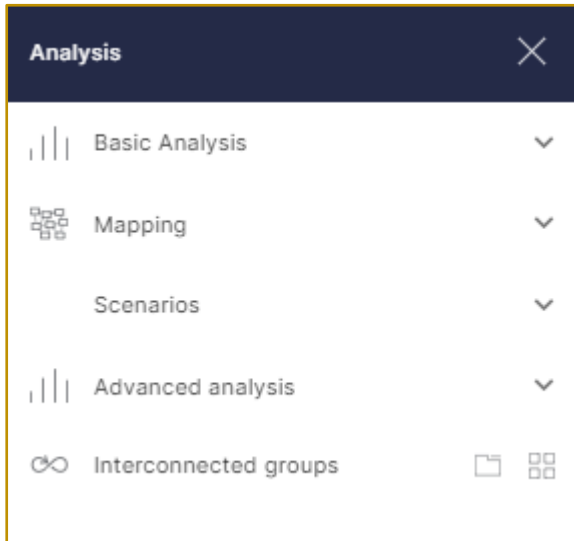
***Strategyfinder* - for Estimation: using Delphi**


Estimation workshops focus on the process: using rating to estimate, gathering views, re-estimating. Thus, the analysis tools are not used often.

Section 1: The Analysis Menu – a summary of the tools

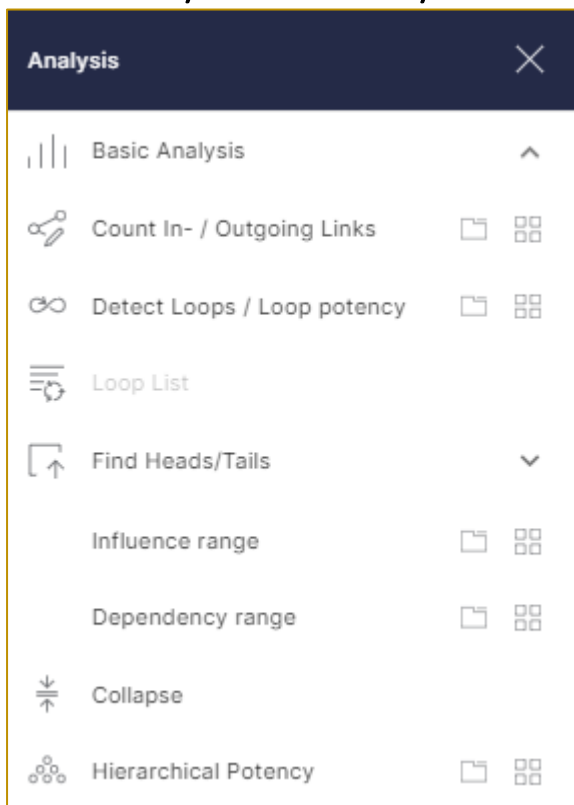


The analysis menu is separated into sub-sections:



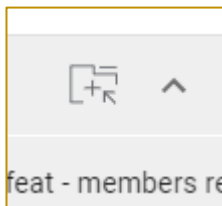
For most analyses there is an option to undertake the analysis on the current view, or on the whole model .

Basic Analysis - summary:



Most of the basic analyses are obvious. The notes below provide a brief summary of those less obvious. A more detailed descriptions later in this manual.

Detect loops/ Loop potency: finds feedback loops and provides the most potent loop statements – those statements in the most loops. Note that by selecting a loop it is then possible to display the

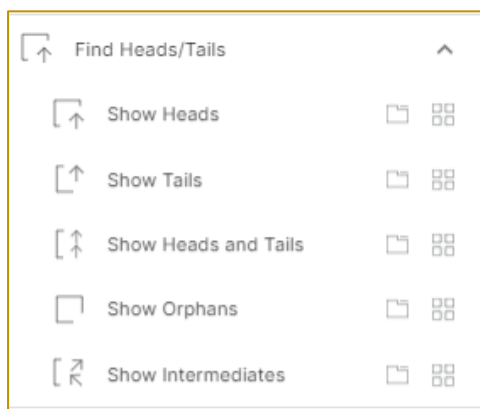


loop in a new view (the left icon with the +).

The report shows a summary, the loops (each can be expanded: after expansion the statements in the loop are shown as selected on the map – red dashed borders) and also the relative potency of each loop (100 = highest potency= impacts the most other loops), and potency nodes (those statement that are in the most loops).

'Loop list' only shows loops once a loop analysis has been conducted. If the model is changed then the loop analysis will need be redone and so the loop list updates.

'Find Heads/Tails' menu extends:




'Heads' are statement with no out-arrows. **'Tails'** are statement with no in-arrows.

'Orphans' are statements with no ins or outs.

'Intermediates' are those statement that are not heads, or tails, or orphans.

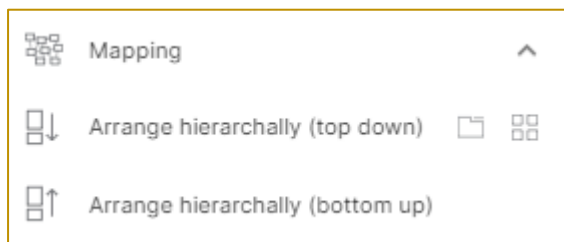
'Influence range': for a selected statement the analysis reveals all statements that are influenced by the selected statement – these are shown as selected statements (red dashed border).

'Dependency range': for a selected statement the analysis reveals all statements which influence the selected statement – the 'drivers' of the selected statement and so options for action to change the status of the selected statement.

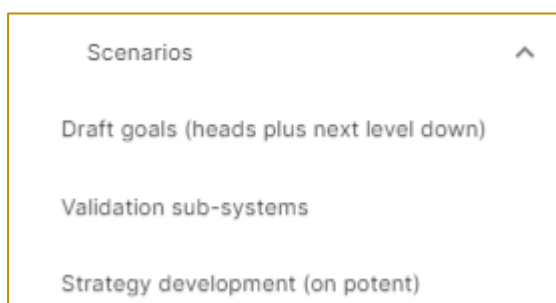
'Collapse' looks for paths between selected statements and shows a single arrow wherever there is a path from one selected statement to another. To undo 'collapse' simply click 'Reset view' . Very useful for providing a summary of key statements in the map.

'Hierarchical potency': explores the structure of the map to find those potential action points (options) at the tail of the map that have the greatest impact on a set of selected statements (usually on a selection of 'goals' and/or strategies). A category of statements can be easily selected using the 'Categories' menu and 'Select By Category', thus providing a quick way of selecting all Goals, all Goals and Strategies, or all Strategies. The analysis takes account of the number of alternative paths from an option to the goals, thus exploring the significance of redundancy – where one path may fail there are others that might work.

The **'Mapping'** menu provides a way of focusing on either the consequences or explanations of statement automatically in a new view:



Scenarios:



These three options each automatically produce new views.

'Draft goals [scenario] (heads plus next level down)': helps identify the *goals system*.

Produces a new view with all of the heads (final outcomes for the current whole map) and also shows those statement that impact the heads.

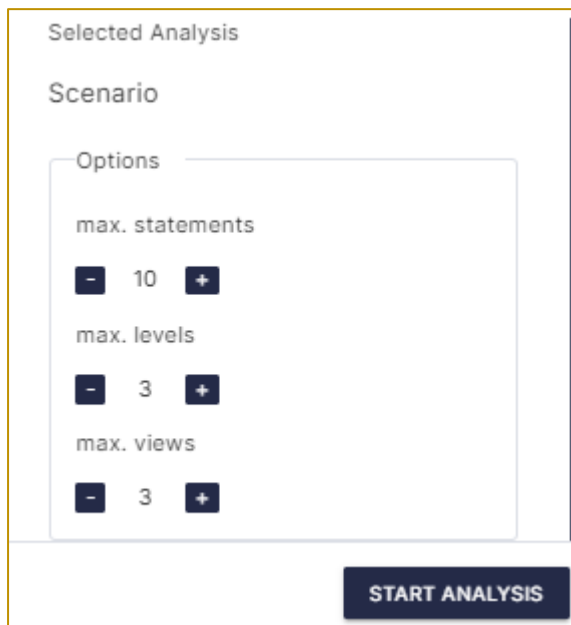
When there are many heads and so possibly also many statements that impact the heads then the maps will need some re-organisation. The best way to do this is to find the heads (using the Find Heads/Tails menu). On the scenario view the Find heads command will grey out all statements that are not heads. Move all of the statements not greyed out (heads) to the top of the view, then 'Reset view' so that all statements show, and re-organise the map into a hierarchy.

The final outcomes are the most likely candidate goals (or negative goals). If they are not goals then the team should ask what these impact (laddering upwards) until goals/negative goals are expressed.

If a head is defined as a goal then it is possible that the statement impacting that goal is also a goal. If a statement at the next level down does get categorised as goal then the team should explore the next level down (2nd level down) and also ask whether that is also a goal, and so on until the goals system is created.

Strategy development [scenarios] (on potent): sets up a series of views where highly potent options for action are shown with their consequences. This is based on a hierarchical potency analysis, and represents a draft. The potency analysis is based on selected statements (see 'Hierarchical Potency') and so the scenarios are based on finding the most potent statements (options) with respect to the selected statements.

The number of scenarios to be shown, the size of the scenario (number of statements), number of levels from potent statement can be chosen using the menu (these are targets/approximations and depend on the structure of the map):



The screenshot shows a 'Selected Analysis' window with a 'Scenario' section. Under 'Options', there are three settings, each with a minus button, a value, and a plus button:

- max. statements: 10
- max. levels: 3
- max. views: 3

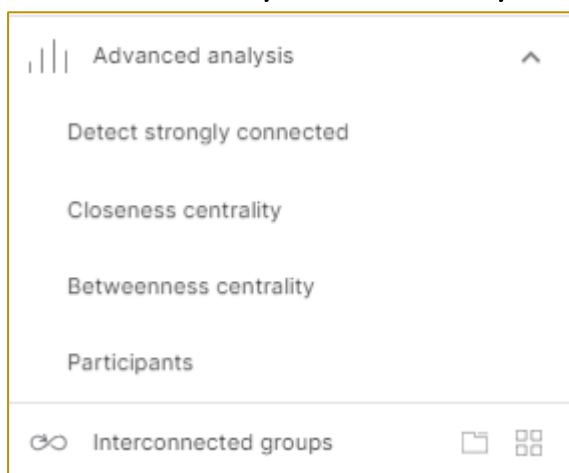
At the bottom right of the window is a dark blue button labeled 'START ANALYSIS'.

The first scenario is developed from the most potent statement, the second from the second most potent, etc.

Strategy development scenarios are designed to assist the facilitator/leader in preparing views for discussion by the group, and they will usually need checking and developing prior to viewing by the group.

'Interconnected groups': does not need any selected statements. Finds all the statements connected independent of the link's directions. Finds 'islands' – a cluster of statements that are linked but not linked to other statements/clusters in the model.

Advanced Analysis - summary



'Detect strongly connected': statements that can reach each other within the component. A strongly connected component will, therefore, contain at least one loop.

'Closeness centrality': measures the average distance to the other nodes in the network. A statement with high score has shortest distance to all other statements. This is a *centrality measure that is an alternative to counting ins/outs*. It used often when using mapping to undertake social network analysis.

'Betweenness centrality': is a measure of how often a node is a bridge between other nodes. Nodes with high betweenness centrality are often important controllers of power or information. Score increases with the number of shortest paths from each statement to any other statement passing through the statement of interest. Those that are highly central *can change the problem definition significantly – so be sure it and its links are correct*.

'Participants': lists all statements and shows the authorship of a statement. The list can be filtered to show by author. This list will not be meaningful unless the settings menu has been set to 'Show Statement Author on hover'.

Interconnected groups: find 'islands' of statement that are connected but not connected to other islands.

Section 2: Analysis tools: why, what does it do, how to do it

This section provides more detail about some of the less obvious analyses – why they might be used, what the analysis does, and how to do the analysis in *Strategyfinder*.

Detect loops/ Loop potency: Analysis to find feedback loops, potent loops and potent intervention statements within loops

WHY?

Vicious/Virtuous feedback is the primary focus for mitigation. Feedback is a *dynamic* - it keeps reinforcing itself. Vicious cycles are very common in risk systems and strategy making.

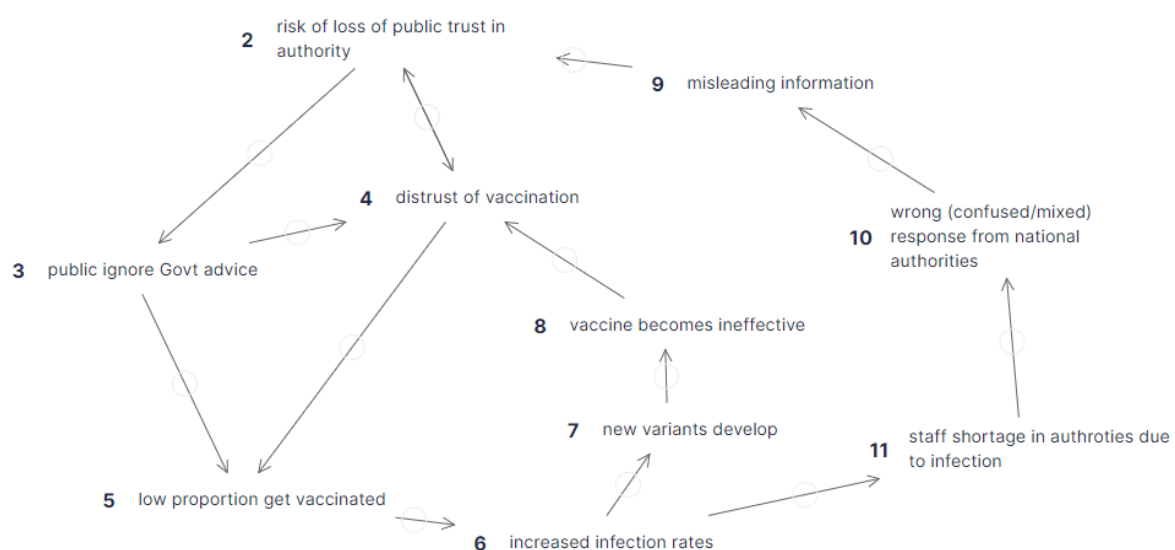
Vicious gets more vicious – so need to kill it or turn it virtuous. Kill it by mitigation that ‘deletes’ a causality (arrow) or a risk. Turn it virtuous by ‘flipping’ it – but this is difficult to do.

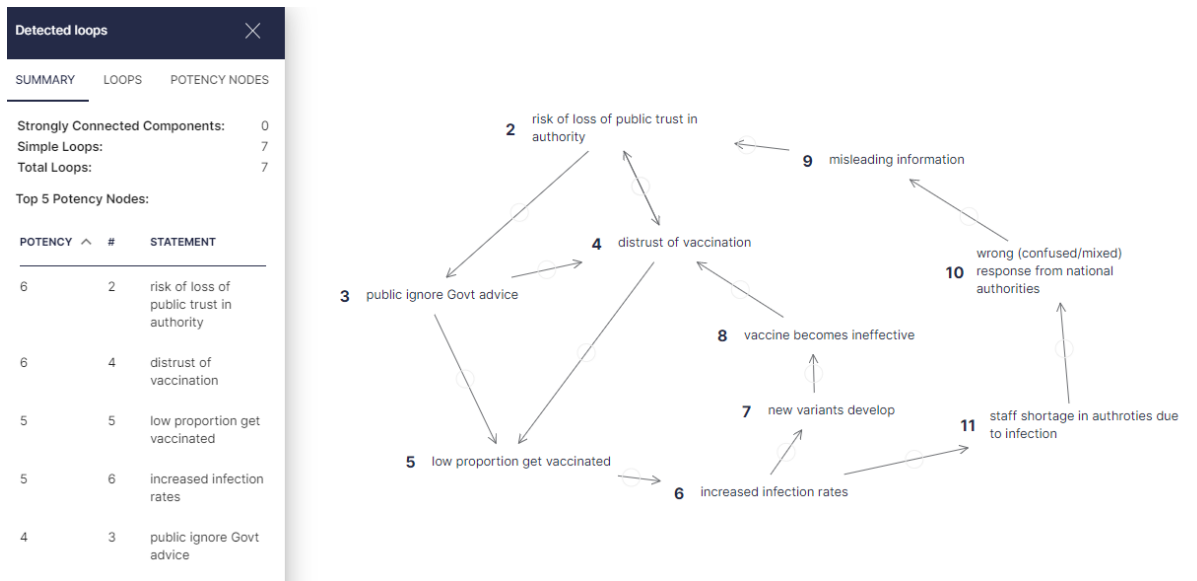
Virtuous should be exploited – so make it work harder/faster/more robustly.

WHAT DOES THE ANALYSIS DO?

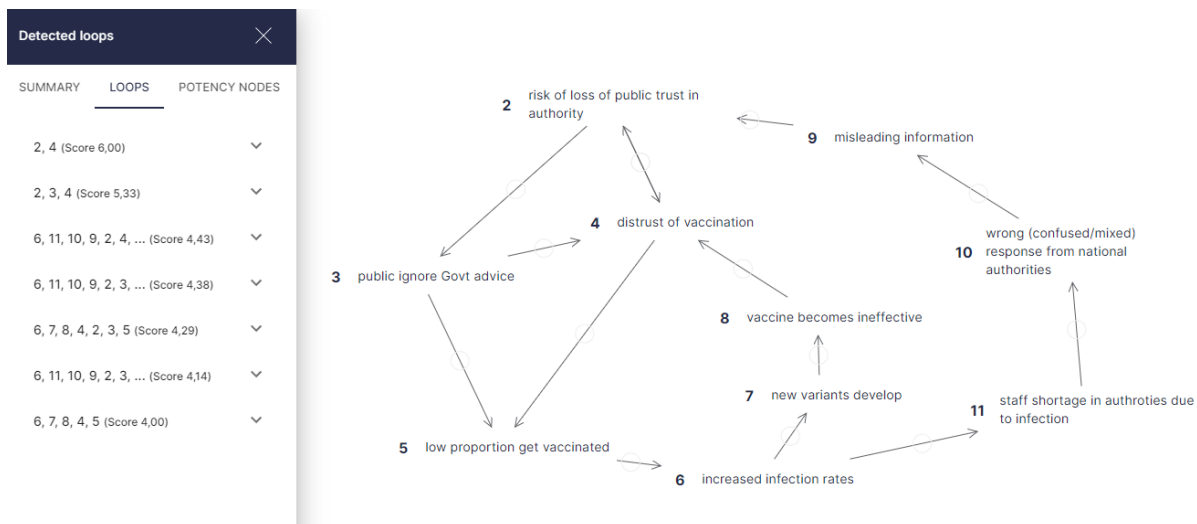
Analysis of loops shows the feedback loops, shows the most potent feedback loop, and shows the most potent statement. Loop Potency here means finding the loop which if ‘deleted’ through mitigation will have the greatest impact, and the most potent statement is that statement that if ‘deleted’ would have the greatest impact.

Example: Consider a real case relating to vaccination during Covid-19

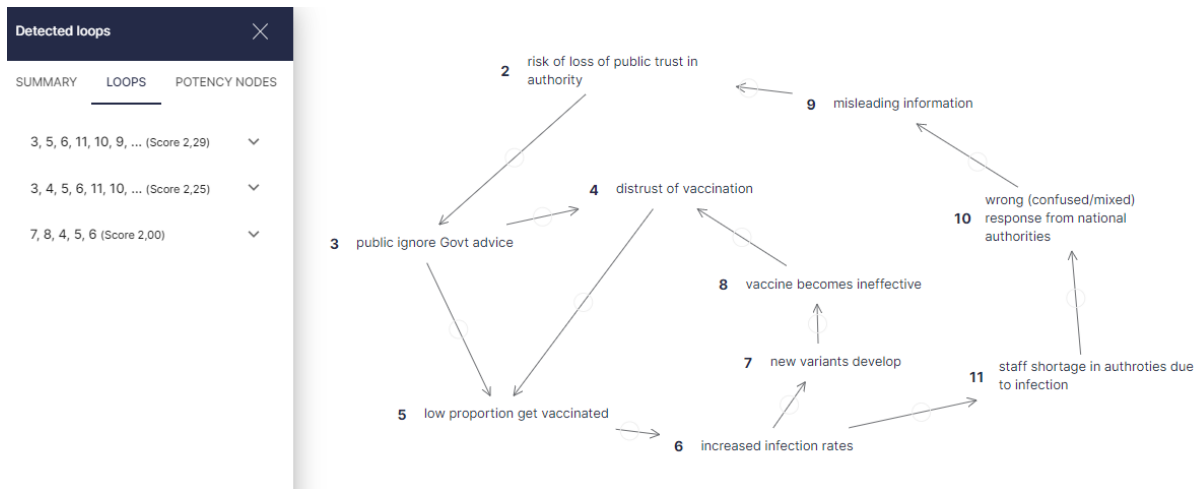




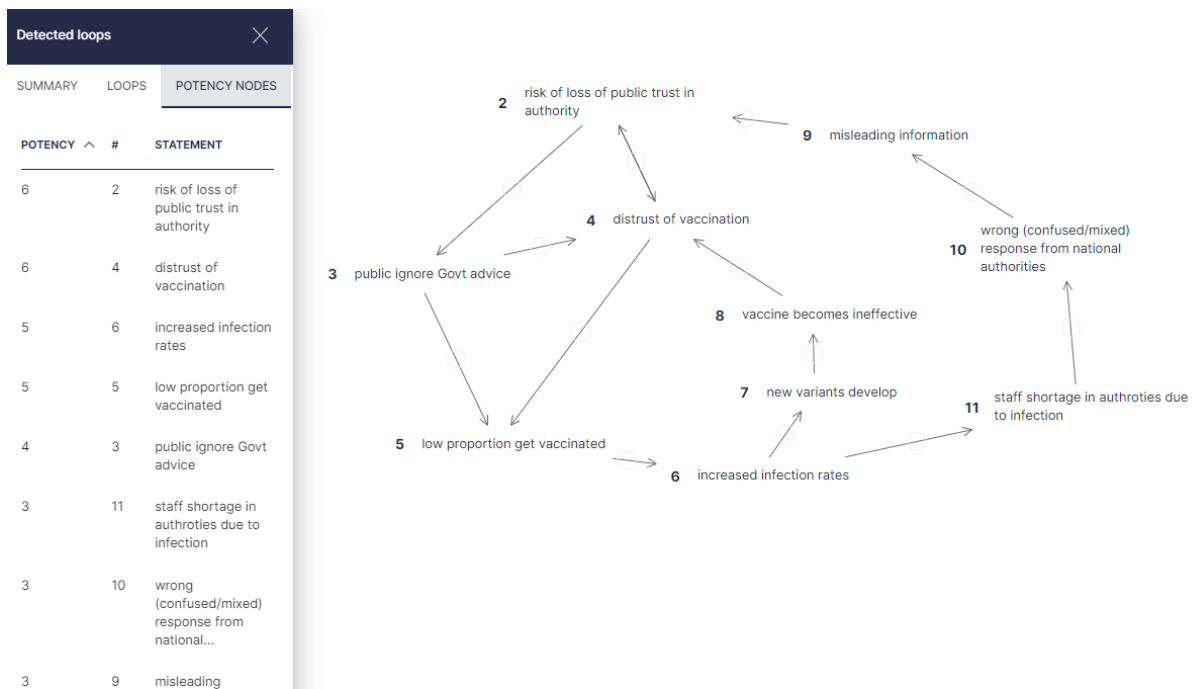
This summary report shows: i) how many loops there are: 7; ii) the top potency nodes (statements). These results can be ordered by clicking on the top of the column.



The loops report lists each loop found and shows a loop score in brackets. The score represents the extent of potency of the loop, where the higher the potency score then the greatest impact will derive from removing that loop – the number of loops found will be reduced by the maximum amount. In the example, if we deleted the loop from 2>4>2 then the number of loops remaining will be reduced to 3 loops from 7.




See above the report after the links between 2 and 4 are removed by strategic action. The number of loops reduces from 7 to 3, and has the maximum impact on the number of loops.



The 'potency nodes' report shows which statement is most potent – that is if strategies were successful in 'deleting' the node then the maximum number of loops would be taken out. Thus strategically 'deleting' statements 4 or 6 has the biggest impact on the number of loops.

Detected loops		
SUMMARY	LOOPS	POTENCY NODES
2, 4 (Score 6,00)		▼
2, 3, 4 (Score 5,33)		▼
6, 11, 10, 9, 2, 4, ... (Score 4,43)		⊞ ⬆
6	increased infection rates	
11	staff shortage in authrot ...	
10	wrong (confused/mixed) re ...	
9	misleading information	
2	risk of loss of public tr ...	
4	distrust of vaccination	
5	low proportion get vaccin ...	
6, 11, 10, 9, 2, 3, ... (Score 4,38)		▼
6, 7, 8, 4, 2, 3, 5 (Score 4,29)		▼
6, 11, 10, 9, 2, 3, ... (Score 4,14)		▼
6, 7, 8, 4, 5 (Score 4,00)		▼

In the loops report a loop can be expanded to show the argument that makes the loop. In addition,

the icon  will show the loop in a new view/tab.

HOW to do it?

Go to 'Analysis' menu.

Choose 'Detect Loops'.

Choose 'View' or 'Model' depending on whether you want the analysis conducted on the whole model or just the current view that is showing.

The 'Loop list' will only work after a loop analysis has been conducted.

NOTE:

The loop analysis finds what are generally referred to as 'simple loops'. In addition there are 'nested loops' where a loop is allowed to use a link more than once. In the above example there 5 nested loops: one nested loop is 9>2>4>5>6>7>8>4>5>6>11>10>9. In this example the links from 4>5>6 are used twice and the loop 8>4>5>6>7>8>4 is nested within the loop 9>2>4>5>6>11>10>9.

The potency analysis produces the same order if simple or nested loops are used, however the scoring properly accentuates the potency when using simple with nested loops for the analysis. In Strategyfinder we use only simple loops for simplicity and because the loop count can be very large: in our example above there are 12 nested and simple loops as compared to 7 simple loops.

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Analysis to find CENTRAL STATEMENTS IN THE NETWORK

WHY?

Statements that are central are usually indicators of important themes/topics that are each at the core of a sub-system within the whole network.

WHAT DOES THE ANALYSIS DO?

1. MEASURE: count of ins. outs and ins&outs

This is the simplest measure of centrality. Counting ins and outs – conducted on either view or model (usually referred to as “degree centrality” where the ins and outs to a statement are “in-degrees” and “out-degrees”).

The core measure derives from summing the number of ins and outs. The higher the number of ins and outs then the more central is the statement.

The measure is simple but is typically indicative of centrality in the total network or on the view.

It has the disadvantage that it only counts the immediate context, however there is a high probability that more paths in the network go through these ‘central’ statements.

HOW to do it?

Go to ‘Analysis’ menu.

‘Count in-/ Outgoing Links’

Choose whether the analysis is to be conducted on the view or the whole model

‘Start analysis’

The results table allows choice of outgoings, ingoings, or ins/outs (both ingoing and outgoing)

After this choice then the results can be listed in order of highest or lowest number of links, or by statement number: click on ‘LINKS’ or ‘STATEMENT’ until desired list order appears.

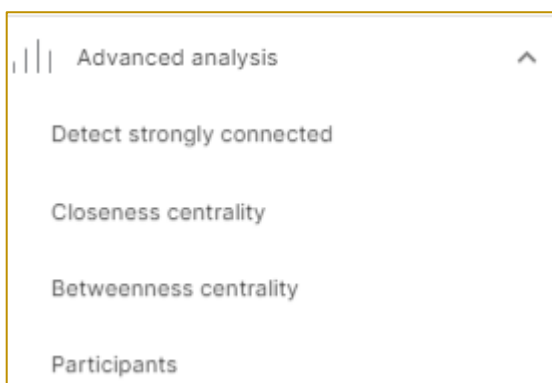
2. MEASURE: closeness centrality

Measures the average distance to the other statements in the network. A statement with high score has shortest distance to all other statements.

This central measure that may be more useful than degree centrality as it accounts for a wider context.

HOW to do it?

Use the advanced analysis menu



3. MEASURE: Betweenness centrality

A measure of how often a statement is a bridge between other statements. the number of shortest paths passing through a given statement. Statements with high betweenness centrality are often important controllers of power or information. Score increases with the number of shortest paths from each statement to any other statement passing through the statement of interest.

The statement with the highest betweenness centrality is not necessarily the statement with the most connections, but the statement with the most connections to others with the most connections. The analysis finds the likelihood that the statement is a bridge between other statements.

Deleting a 'bridge' arrow can change the problem definition significantly – so it is important to be sure the link is valid.

HOW to do it?

Use the advanced analysis menu.

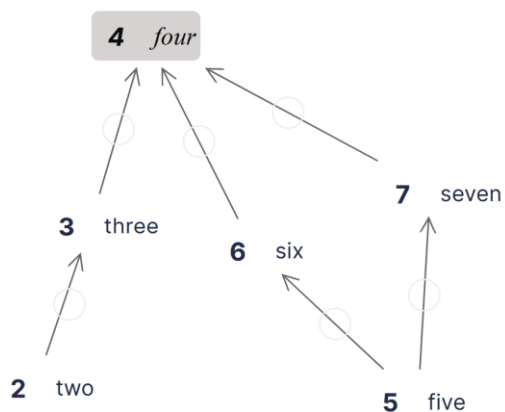
Analysis to find POTENCY OF POTENTIAL INTERVENTIONS (drivers of goals): Hierarchical potency

WHY?

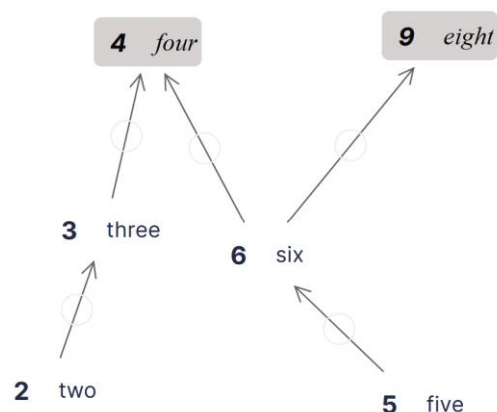
The examples show the principles of hierarchical analysis to find the statements that are the most potent drivers of the goals. In the below examples the goals are shown in grey background.

WHAT DOES THE ANALYSIS DO: examples

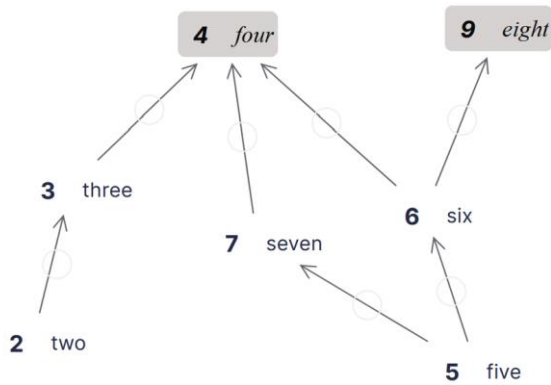
In these examples the selected statements are assumed to be goals – shown in grey background (using the 'Categories' menu and 'Select By Category').



In the above map, option 5 is more potent than option 2, because option 5 is **more robust** – there are 2 routes to the goal (5>7>4 and 5>6>4), and so if one route fails the other is available.

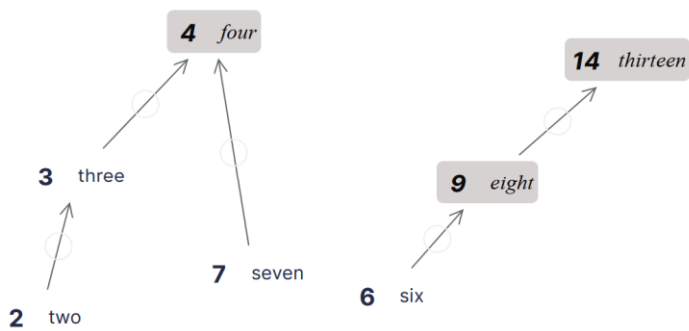


In the above figure, options 5 and 6 are more potent than options 2 and 3, because options 5 and 6 impact 2 goals whereas options 2 and 3 impact 1 goal.

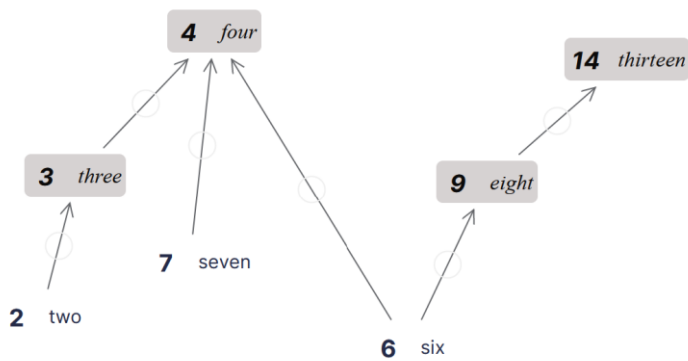


In this map, option 5 is more potent than any other option because it impacts 2 goals and is robust with respect to goal 4.

Hierarchical potency when the goals are an hierarchical network/system:



In the above figure, option 6 is more potent because it impacts 2 goals, whereas option 2,3,7 impact 1 goal.



Similarly, here option 6 is more potent because impacts goals 4,9,14 whereas 2 impacts 3,4.

The Impact of Loops on Hierarchical Potency

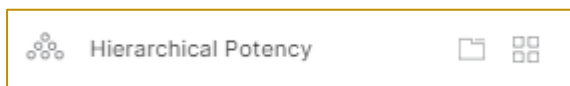
Are treated as if a single statement because any statement in the loop has the same consequences.

HOW TO DO IT?

Select the statements to be used to do the analysis. Most often these will be Goals, Strategies, or Goals and Strategies. If selecting categories then use the 'Categories' menu and 'Select By Category'. Multiple categories can be selected this way.

Alternatively simply select those statement to be used for the analysis. In this way, for example, a sub-set of a category set can be selected.

Go to 'Basic Analysis' menu and select 'Hierarchical Potency' and select whether the analysis is to be on the view or on the whole model.



NOTE: see Hierarchical Potency Analysis method – see Appendix 1

Analysis to find what is influenced by a statement(s): Influence Range

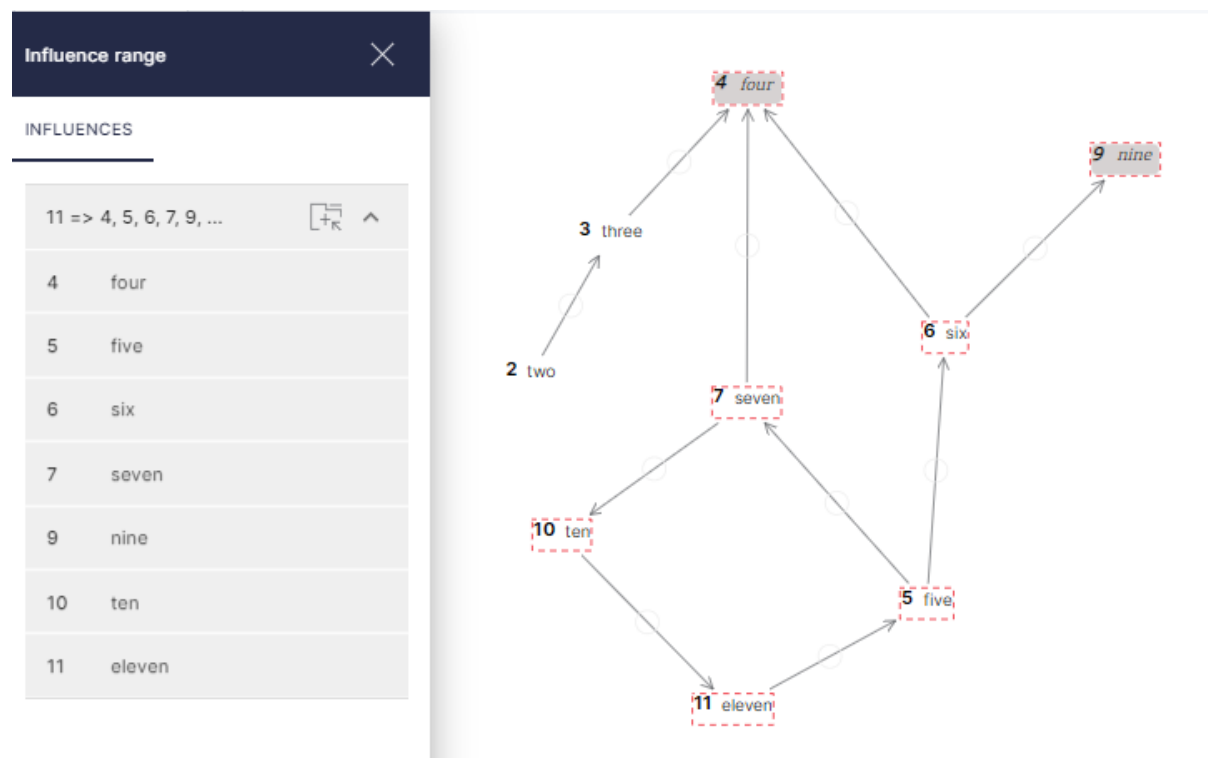
WHY?

It is useful to be able show all of the statements that are impacted/influenced by a chosen statement.

WHAT DOES THE ANALYSIS DO:

Finds all of the others statements in the model or the view that a selected statement(s) influence.

In this simple example statement 7 was selected for analysis and Influence Range selected from the Basic Analysis menu. The results show as selected statements all those influenced by statement 7.



HOW TO DO IT?

Select the statement(s) of interest: click a statement and a red box appears around it, if more than one statement is of interest then hold the shift key and select the other chosen statements.

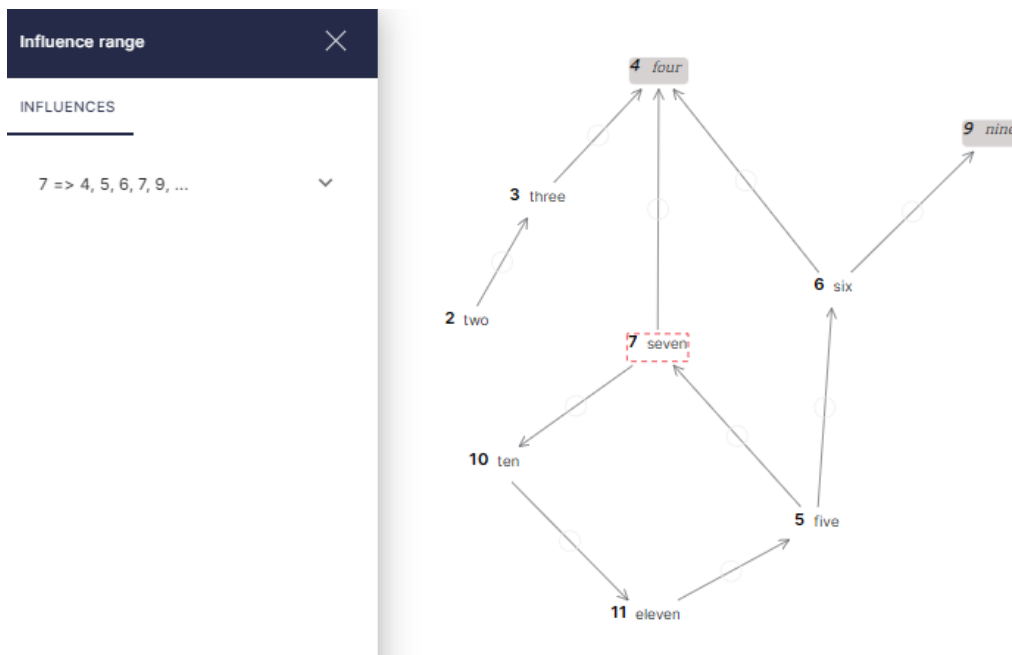
Go to the 'Basic Analysis' menu.

Select 'Influence Range'

Choose whether the analysis is to be conducted on the current view or the whole model (icons):



Initial Results show as:



By clicking on the down chevron, the list of statements is expanded, and the statements influenced are shown as selected (as well as the original selections), as shown in the WHAT DOES THE ANALYSIS DO example.

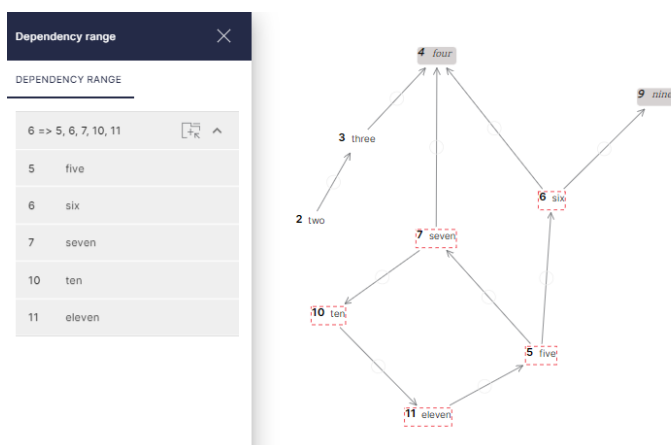
Analysis to find what a statement(s) depend upon: Dependency Range

WHY?

It is useful to be able to show all of the statements that any particular statement(s) is impacted/influenced by/dependent upon.

WHAT DOES THE ANALYSIS DO:

It is the reverse of influence range, and, using the above example, statement 6 is selected for analysis and Dependency Range selected from the Basic Analysis menu. The results show as selected statements all those statements that statement 6 is dependent upon:



HOW TO DO IT?

Follow the same procedure as for Influence Range.

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Analysis to Develop Scenarios/Sub-systems

Analysis to find a *Goals System* – Draft goals

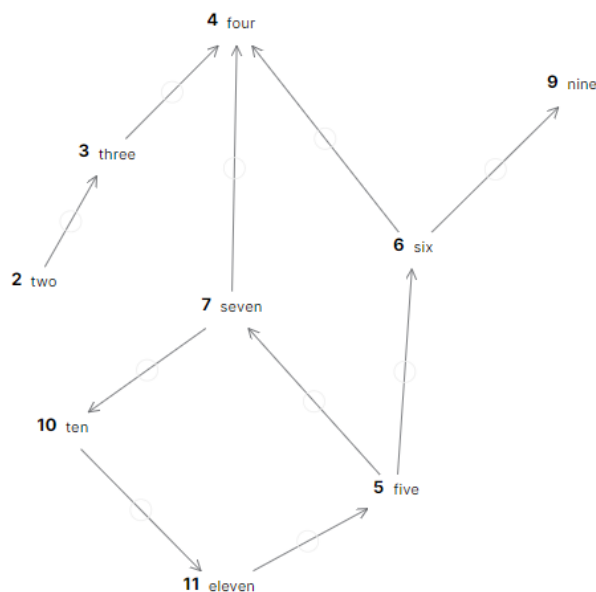
WHY?

At any time during a workshop it is important for a team to be clear about the goals they are seeking to achieve through the agreed actions. Often goals are expressed negatively (what to avoid) – particularly when undertaking a systemic risk management session.

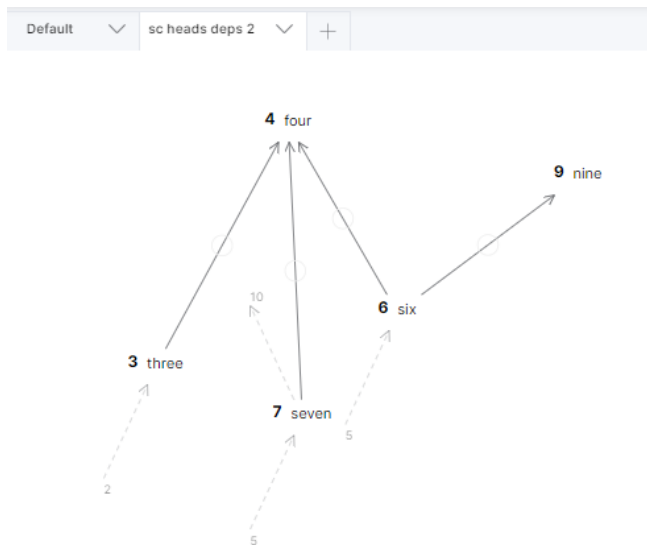
The best approximation to goals will always be, at least, the final outcomes – those statement with no out-arrows. However, it may be that these are not goals and that the consequences of these outcomes will be goals, and they have not yet been expressed.

To help in the development of the goals system this analysis automatically sets out, on a new view, all of the 'heads' (with no out-arrows) and also one level down from these (the first level of influences). This will be the best draft of the goals and it can be discussed with the team and the goals developed and categorised.

Thus, in the map below (shown earlier):



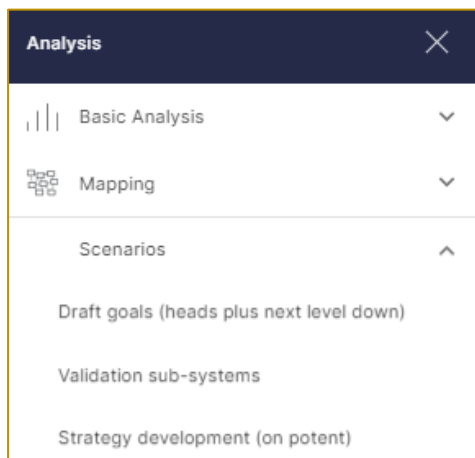
the outcome of the analysis will be to automatically produce the following view:



HOW TO DO IT?

Simply select 'Scenarios' from the analysis menu

Choose 'Draft goals (heads plus next level down)'



Analysis to show *Strategy Development* Scenarios (SUB-SYSTEMS)

WHY?

Strategy development usually focuses first of the most potent options – those that can impact the most goals and in ways that allow for redundancy (failure in some paths to the goals but leaving others able to work).

This analysis uses **Hierarchical Potency** to find the potent options and then automatically produces a series of views where the highly potent option is shown with its consequences/influences. Thus it is similar to a two-step process of finding potent options with **Hierarchical Potency** and then using **Influence Range**.

The analysis provides a first draft of views that can be a focus for the group as they seek to develop strategies/actions.

HOW TO DO IT?

Choose 'Strategy development (on potent)' from the Scenarios menu.

Analysis to *Collapse* the model to focus on key statements

WHY?

It is often useful to see a summary of key parts of the model, where only selected statements appear and paths between them are summarised.

Collapsing is particularly useful to look at a summary of agreements: for example, agreed actions, strategies and goals.

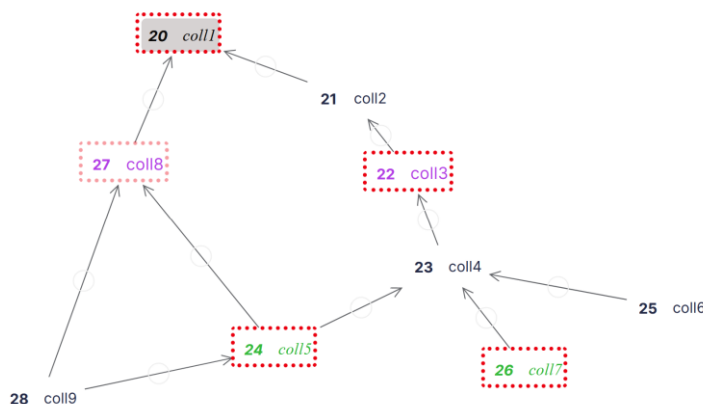
The links on a collapsed map now show that there is at least one path of links/arrows between the statements.

WHAT DOES THE ANALYSIS DO and HOW to do it: example

NOTE that collapse may not work when there several hundred/thousand feedback loops (as the browser cannot cope with the many calculations).

Consider the below simple map, where there is a single goal (20), two agreed strategies (22,27), and two agreed actions (24,26).

A summary of the agreements is required and so the statements to be included in the summary are selected (either by i) manually clicking on each statement in turn with the shift key held down, or ii) by using the 'select by category' option in the 'categories' menu):



Next the 'collapse' option is selected from the 'mapping' menu, or the 'analysis' menu. The results will be:

