The networks will be represented in two data structures:

1. Node, represents the individual skill comprises several informations related to it, for example: label, number of occurrence in the article set, etc.

```
public class Node {

public String label;
public float occur;
public boolean visited=false;

public Node(String l, float o, boolean v)
{
	this.label=l;
	this.occur=o;
	this.visited=v;
}
}
```

2. Edge, represents the link between two pair of skills (nodes), which is also be used to confirm that these two nodes appear together in the article set.

```
public class Edge {

public Node node1;
public Node node2;
public float cooccur;
public double strength;
//to define to which network in pass-1 does this Edge belongs to
public int networkpass1;
//to define to which network in pass-2 does this Edge belongs to
public int networkpass2;
//indicates the order in which the link was added to the network during
pass-1 networks
public int order;

public Edge(Node n1, Node n2, float co, double s, int netpass1, int
netpass2, int o)
{
	this.node1 = n1;
	this.node2 = n2;
	this.cooccur = co;
	this.strength = s;
	this.networkpass1 = netpass1;
	this.networkpass2 = netpass2;
	this.order = o;
}
}
```

The final results after executing the co-word analysis algorithm with minimum co-occurrence=4 can be seen in Table 1 below.

Table 1 Co-word Analysis Result

Node1	Node2	Co-occurrence	Strength	NetworkPass1	Order	NetworkPass2Node1	NetworkPass2Node2
Programming	Statistics	2	0.0167	-	-	-	-
SQL	Performance Testing	1	0.0056	-	-	-	-
Analytics	R	17	0.011376	3	2	-	-
SAS	Hive	1	0.005208	-	-	-	-
Analyst	Python	10	0.001417	4	2	-	-
Business Intelligence	R	12	0.013348	3	1	-	-
Analysis	Matlab	1	0.0002358	-	-	-	-
Agile	Prototype	2	0.072727	-	-	-	-
Analyst	LeSS	5	0.00850	4	1	-	-
SPSS	Architect	4	0.080808	1	1	-	-
C	SQL	4	0.003571	-	-	1	1
SPSS	C	5	0.028409	1	2	-	-
SQL	Hadoop	9	0.045	2	1	-	-

The figure 1 below depicts how the nodes and links is interconnected given the result after executing the co-word analysis. The difference in the node color represents a different network or cluster which is known from the 'NetworkPass1' column in Table 1 above.

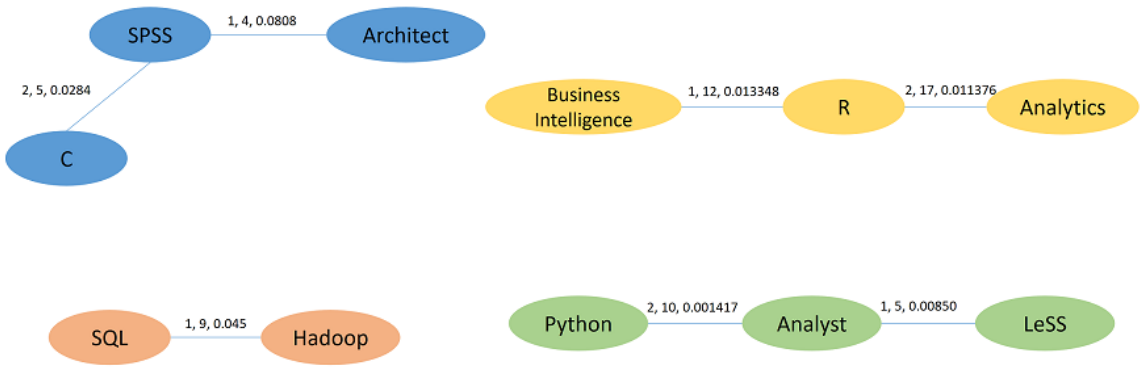

Figure 1 Skills Networks

Another information to be visualized is the 'networkpass2node1' and 'networkpass2node2' from the table 1, which denotes all edges that connect nodes from different network in pass-1. Its goal is to link nodes between different networks. Each of it represents:

a. If the ‘networkpass2node1’ equals to ‘1’, then those edge should connect the node in the network of pass-1 and the edge’s direction is from node 1 to node 2. For example C – SQL edge connects node C (in network ‘1’) to node SQL (in network ‘2’).
b. Similar with explanation above, the ‘networkpass2node2’ to define that the edge is used to connect node 2 to node 1.

We also have another informations which are called ‘centrality’ and ‘density’, that can be seen in table 2.

Table 2 Centrality and Density of Network

Network	Centrality	Density
1	0.032	0.06
2	0.40	0.04
3	…..	……

The table 2 above keep all informations to draw the ‘strategic diagram’ in figure 2. Each network pass-1 has two values regarding the degree of interaction to other networks (centrality) and the internal strength of the network itself (density). Both values normally are plotted into a two-dimensional diagram. Typically, the horizontal axis represents centrality, the vertical axis represents density, and the origin of the graph is at the median of the respective axis values. This map situates each skill network within a two-dimensional space divided into four quadrants.

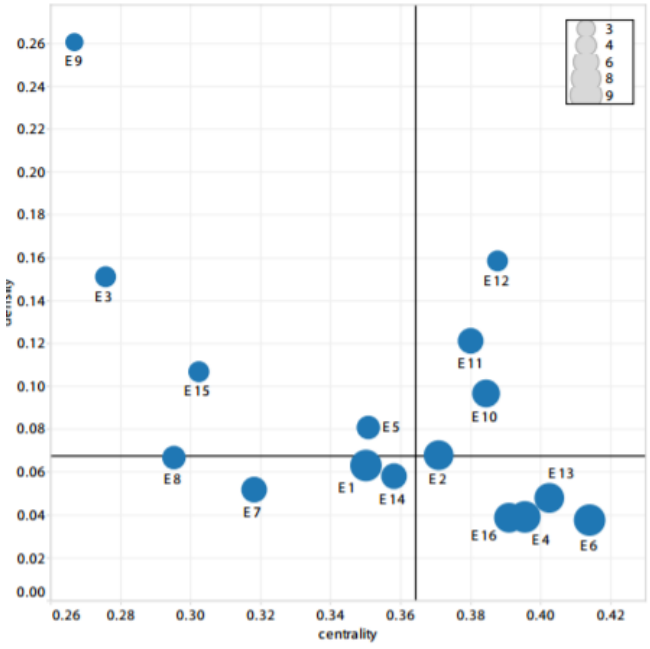

Figure 2 Strategic Diagram