



# Heterogeneous Graphs for Academic Impact Assessment

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## Introduction

**Academic Social Impact:** The consumer of scientific information is not always the scientist who have published their work but also the people who are non scientist and government officials or business. In this scenario it is a need to measure the impact of the scholarly resources outside the scientific community.

**Current Trend in Capturing the Scholarly Impacts in Social Media:**

- How many times a publication is mentioned in twitter, facebook walls and other social networking sites.
- How many times a publication is downloaded or shared from the social bookmarking services like CiteUlike and Mendeley.

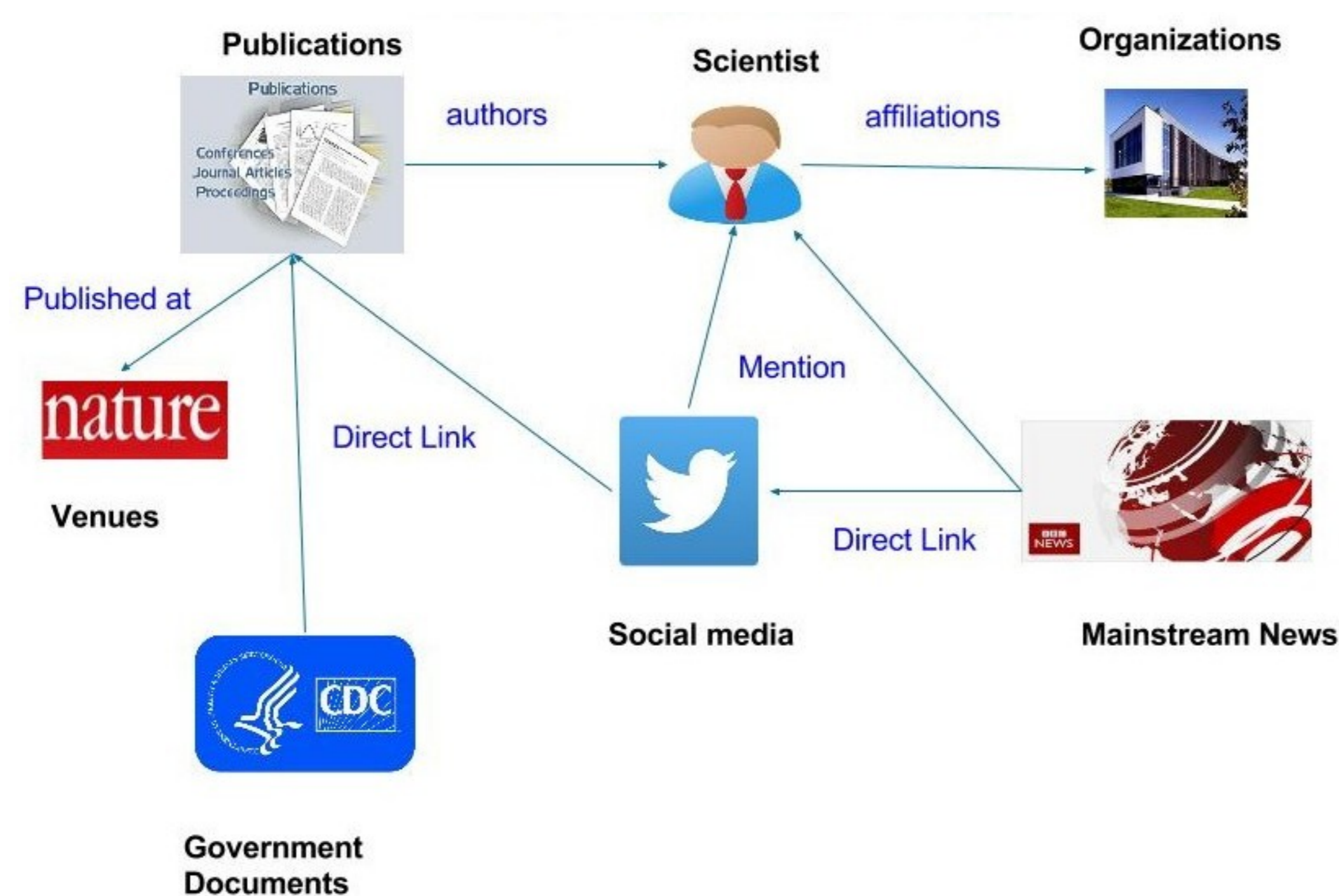
The count measures for downloads, shares, mentions of scholarly publication and other academic resource in social media is useful because it tells us the popularity but it does not tell us about how influential or impactful is the resource.

**Motivation:** Measure the impact of scholarly publications, scientists, organizations and venues (Academic Entities) in a social media.

**Research Goal:** Design an approach to measure the social impact of Academic Entities using a heterogeneous graph.

## Heterogeneous Graph for Academic Entities

A graph is called a *heterogeneous* if the set of the nodes or vertices and set of edges or links are of dissimilar type. The academic entities consists of different types of nodes and each nodes are associated with different kind of relationships as shown in the figure below:

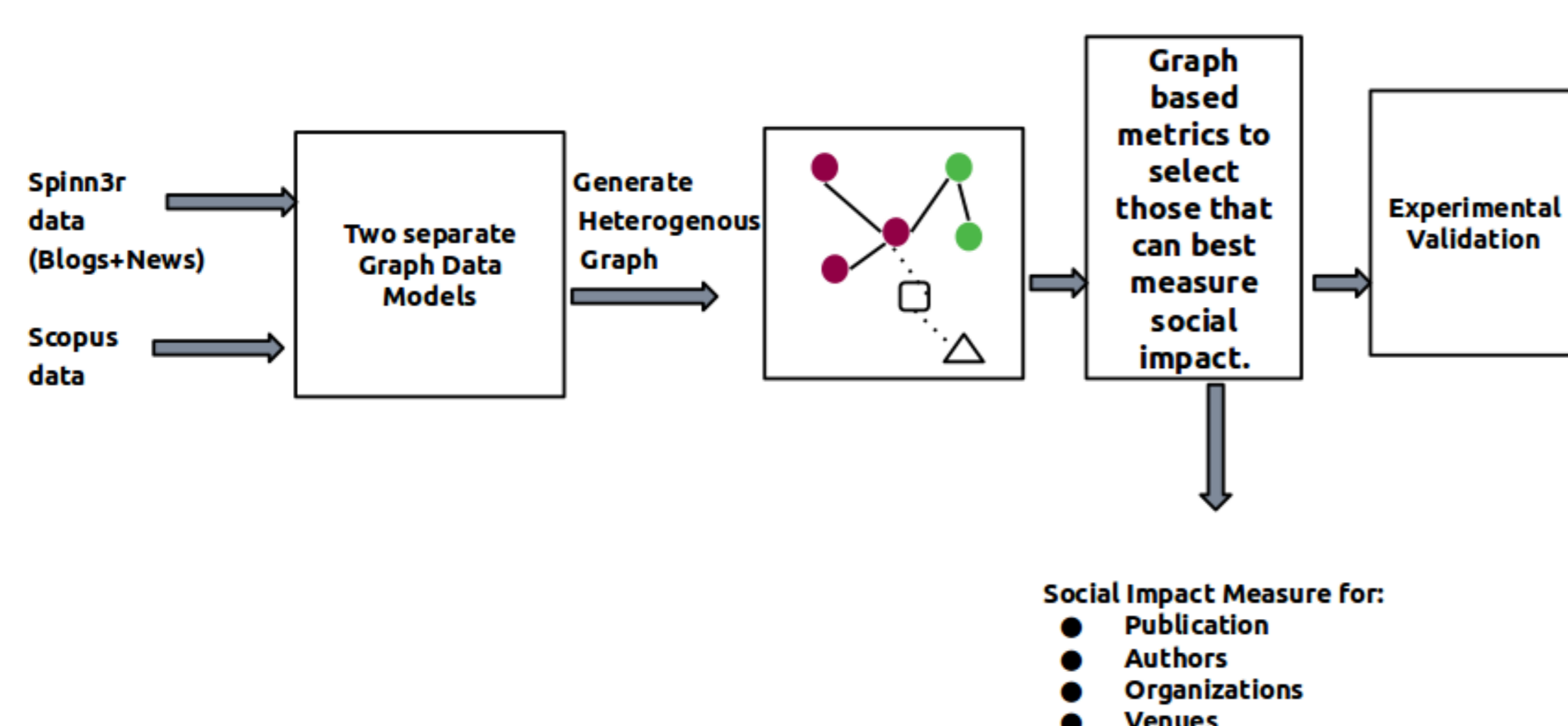


## Solution Approach Overview

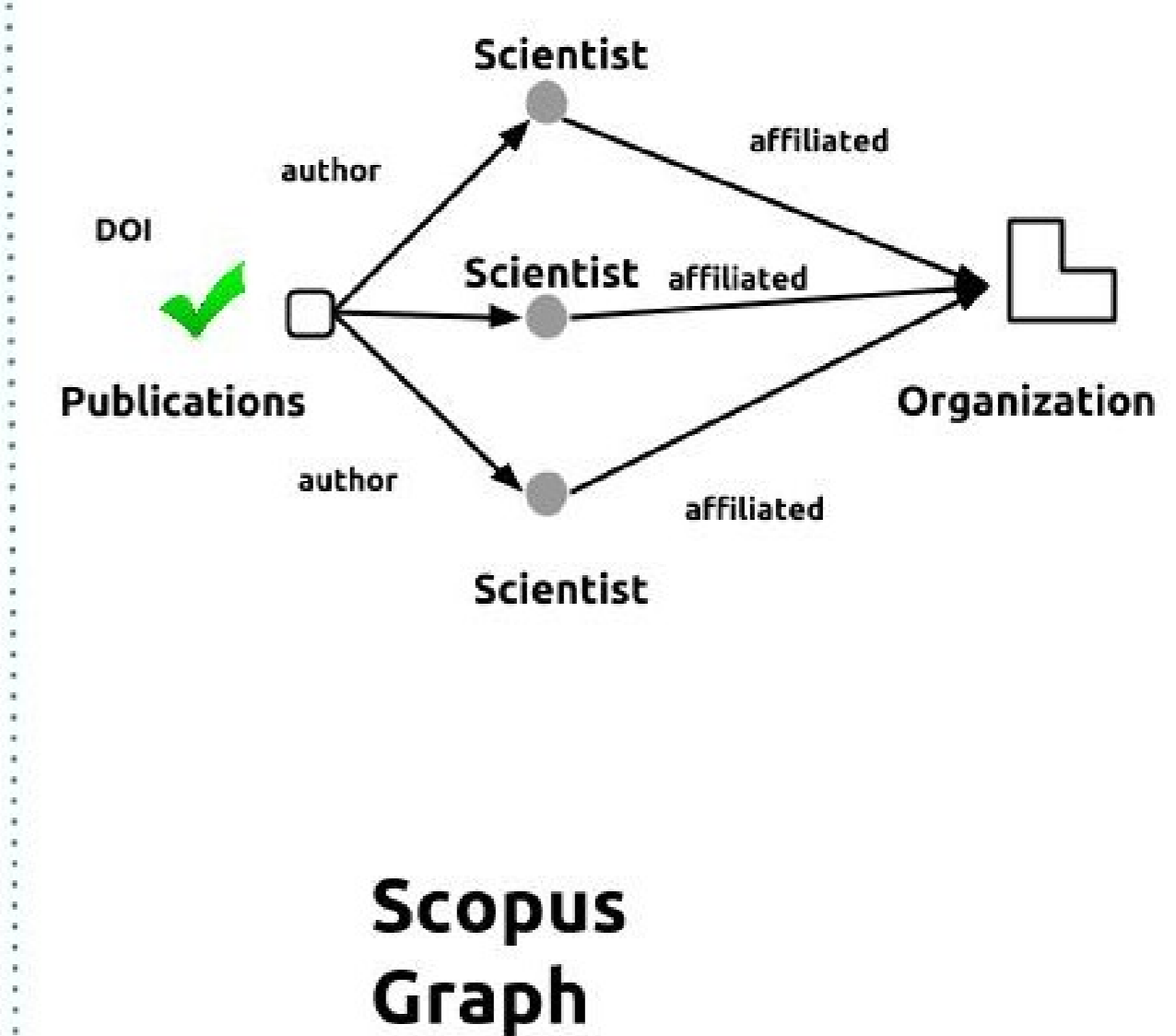
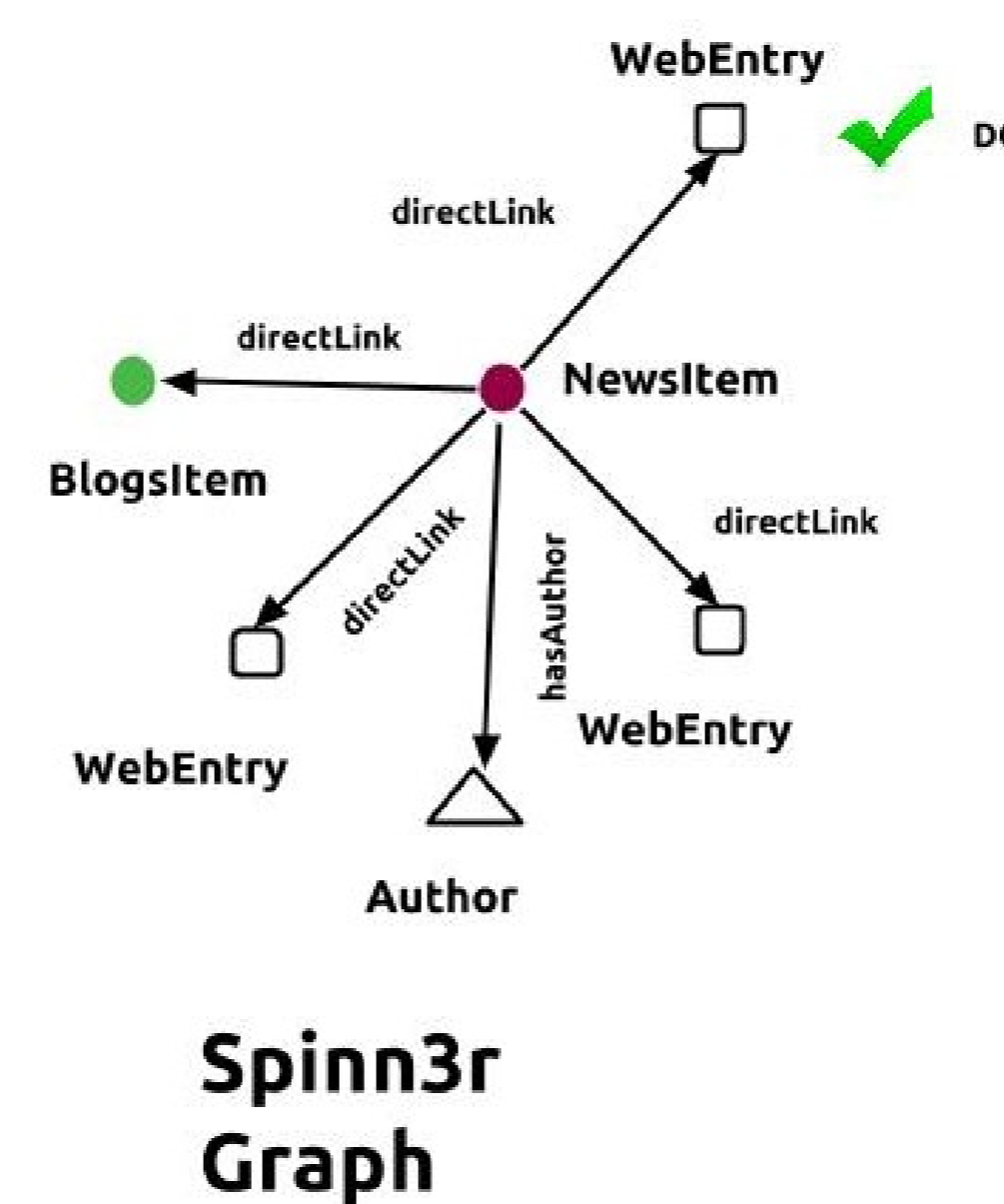
### Data Source

- *Spinn3r* data which is a crawl of blogosphere from which 50 GB of mainstream news and 182 GB of weblogs are collected.
- *Scopus* is a bibliographic database from which publications, citations, scientist, publication venue and organizations informations are collected.

The overview of the approach is shown below:



## Integration of Graph Data



## Graph Based Metrics

Metric	Definition
Page Rank	Relative Importance of nodes in the network
HITS Authority	Authority of nodes in the network
Katz Centrality	Gives the relative influence of the nodes in the network
Log Node Weights	Scores based upon the information forwarding efficiency of the nodes
Combine Katz Log Node Weights	Scores combining log based weights of nodes and katz centrality

Table: Description of the Graph based metrics

## Results and Evaluations

