



**ATPER**

UNIVERSITY OF  
**Southampton**

School of Electronics  
and Computer Science

# Supporting the evaluation of the trustworthiness of Web information using Semantic Web technology

Jarutas Pattanaphanchai

1 June 2013

- > About Arthritis
- ✓ Treatment Options
  - Over-the-counter Medications
  - Prescription Medications**
  - More Than Medication
- > Beyond Medication



## Prescription Medications Used to Treat Arthritis Symptoms

Text A A A Share +

Prescription medications are an available treatment option to help manage arthritis symptoms. Talk to your doctor about them to see what may be best for you.

### Acetaminophen

At higher doses, acetaminophen is available only by prescription. As with the over-the-counter version, prescription acetaminophen helps relieve arthritis pain but does not reduce inflammation.

### NonSteroidal Anti-Inflammatory Drugs (NSAIDs)

Prescription NSAIDs are often recommended by doctors to treat arthritis symptoms.

### Narcotic Painkillers

Narcotics relieve pain by targeting pain receptors on nerve cells. But they do not reduce inflammation. Some are prescribed for short-term use because of the potential for physical and psychological dependence.

### Corticosteroids

These anti-inflammatory agents may be injected into the affected joints to temporarily relieve osteoarthritis pain. They are not recommended for more than 2 to 4 treatments per year. These can also be taken orally for the treatment of rheumatoid arthritis.

### Hyaluronic Acid Substitutes

This treatment is approved only for osteoarthritis of the knee. It is given in a series of 3 to 5 injections and is designed to replace the component of the joint involved in the joint's lubrication and nutrition.

### Disease Modifying Anti-Rheumatic Drugs (DMARDs)

Disease modifying anti-rheumatic drugs (DMARDs) have been shown to reduce the signs and symptoms of rheumatoid arthritis as well as slow the progression of the disease. In most cases, once a diagnosis of rheumatoid arthritis is confirmed, a DMARD is started.

Everyone responds differently to medications so only you and your doctor can decide which one is right for you. Talk to your doctor about the right treatment option for you.

**Find out about a prescription NSAID available from Pfizer.**

**LEARN MORE ▶**

> Next: More Than Medication

## Brain Scans Give Clues to Antidepressant's Effects

Brain scans during memory tests might help predict which depressed patients will be helped by a fast-acting drug, a new study reports.

Major depression is marked by feelings of sadness, loss, anger or frustration that can interfere with daily life for many weeks. Symptoms can also include memory loss and trouble focusing.

Most depression-fighting drugs must be taken for several weeks before working, which can cause an agonizing wait for patients. Because different people respond to different medications, patients may need to try several drugs over a month or more before getting symptom relief.

Several years ago, NIH researchers discovered that a drug used to treat motion sickness could also rapidly reduce symptoms of depression. But the drug, called scopolamine, didn't work in all patients.

To try to predict the drug's effects, the researchers used MRI to track brain activity in adults with and without major depression. People with major depression are known to have unique patterns of brain activity when asked to pay attention to the emotional content of images. They also tend to remember negative information (such as sadness) better than positive or neutral information.

The researchers found that scopolamine relieved symptoms in 11 of the 15 participants who had major depression. Scopolamine's effectiveness was linked to activity in a specific brain region when patients were asked to remember the emotions on faces that flashed by. Activity in this same brain region was also altered by infusions of scopolamine.

The findings suggest that activity in this brain region might provide early clues about how well scopolamine will work in different patients. Ongoing studies are exploring how the brain's response to emotional images might help guide treatment strategies for major depression.

Find ANY word

### HEALTH CAPSULES

- [Brain Scans Give Clues to Antidepressant's Effects](#)
- [Living with Low Vision](#)
- [Featured Website: Inside Life Science](#)

### Links

- [Depression](#)
- [Medications for Mental Health Problems](#)
- [Depression \(Age Page\)](#)

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### Latest Research News from NIH



[Chelation Therapy May Help Reduce Cardiovascular Events](#)



[Technique Directs Immune Cells to Target Leukemia](#)

# Problem


- Assessing the quality of information on the Web is a challenging issue:
  - Decentralized data publishing platform.
    - No inherent quality control.
  - Web content format (presentation and layout)
    - Difficult to easily determine Web information was authored from genuine (authentic) sources.
    - Fogg, *et. al* (2003), Princeton Survey research associates (2002), and Wathen and Burkell (2002).

Less trustworthy

**arthritis.com**  
Experience. Knowledge. Options.

> About Arthritis > Treatment Options > Beyond Medication

> About Arthritis  
✓ Treatment Options  
Over-the-counter Medications  
Prescription Medications  
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Appears  
trustworthy

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A monthly newsletter from the National Institutes of Health, part of the U.S. Department of Health and Human Services

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April 2013

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<http://newsinhealth.nih.gov/issue/apr2013/capsule1>

# Literature reviews

- Providing supportive information concerning the provenance of the Web content
  - Increasing an individual's confidence pertaining to the trustworthiness of information
  - Improvement in the accuracy of their assessments
  - Rieh & Belkin, 1998 and Wathen & Burkell, 2002.

# Solution

- We proposed a framework to help users evaluate the trustworthiness of Web information, called TWINE
  - Automatically gathers supportive information based upon the trustworthiness criteria
  - Implementing prototype based on the framework as a chrome extension



# Development of the trustworthiness criteria

# Trustworthiness criteria

Criteria	Descriptions
Authority	The author's identification and credentials
Accuracy	The error-free expression of information
Currency	How up-to-date the web information is
Relevance	How well the content meets the user's needs

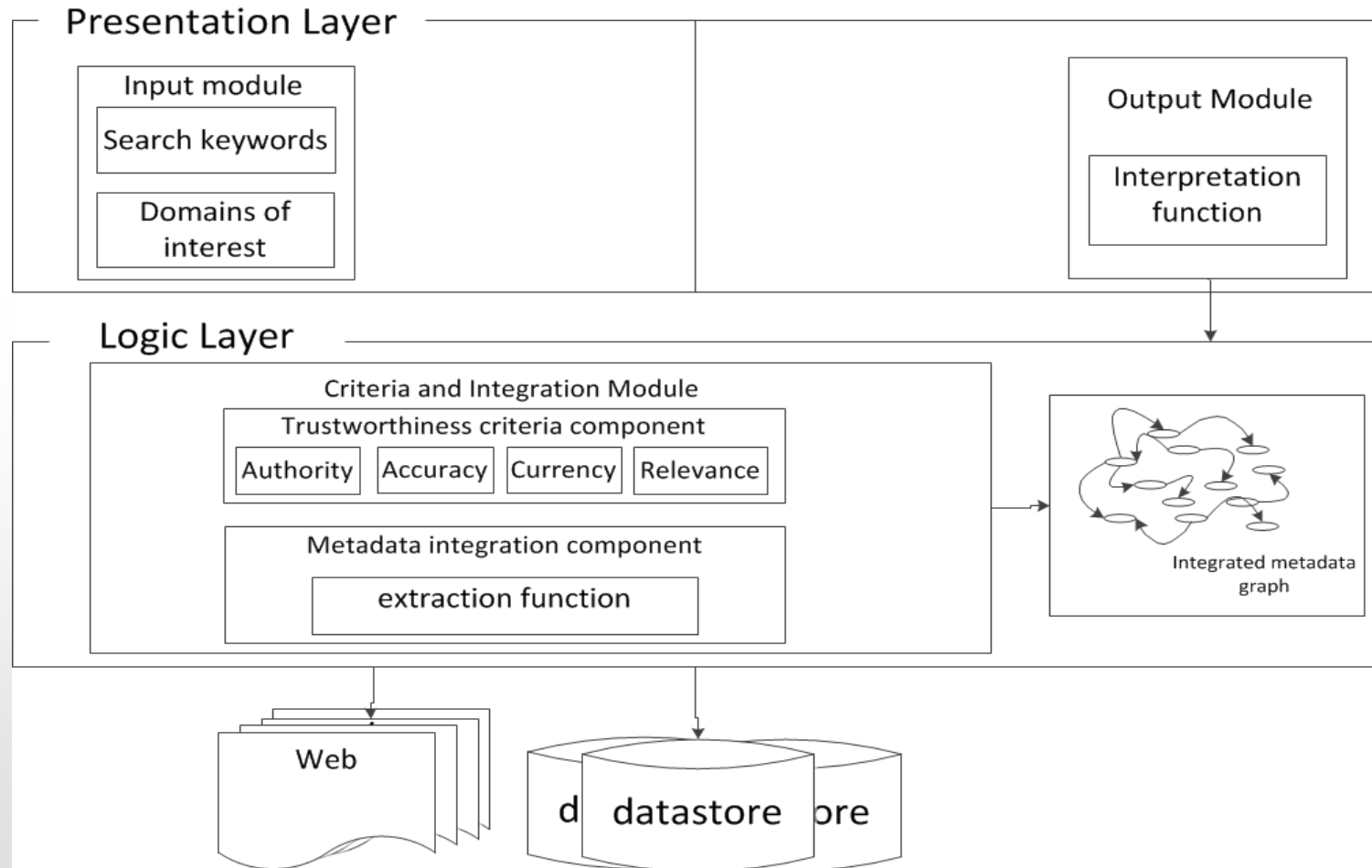
# Expert validation

- Results analysis
  - Quantitative analysis
    - Wilcoxon signed rank test analysis (non-parametric)
  - Qualitative analysis
    - Thematic analysis

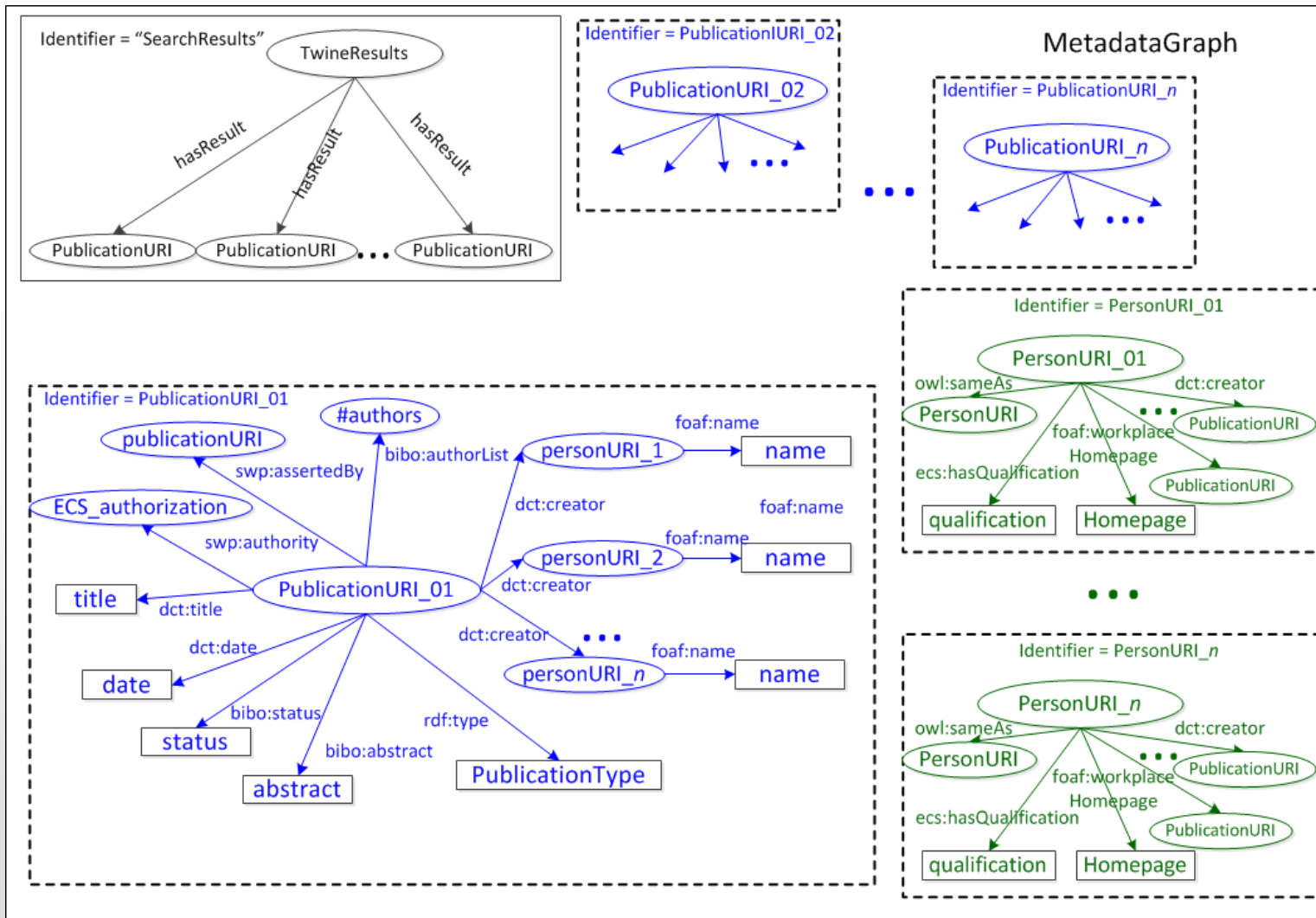
Criteria	Validated components	Median from the experts' answers	Z
Authority	- The name of the creator	3.00	1.000
	- The creator affiliation	3.00	0.655
	- The creator's position	3.00	0.083
Accuracy	- Information of the editorial process (e.g. peer-reviewed)	3.00	0.705
Currency	- The publication date of content	3.00	0.705
	- The last modification date of the content	2.50	0.160
Relevance	- Number of citation	3.00	0.317
	- Publication medium (e.g. book, journal, article)	3.00	0.180
	- An overview of the content (e.g. title, abstract)	2.50	0.194
	- A list of references	3.00	0.655

# Framework development

# Architecture



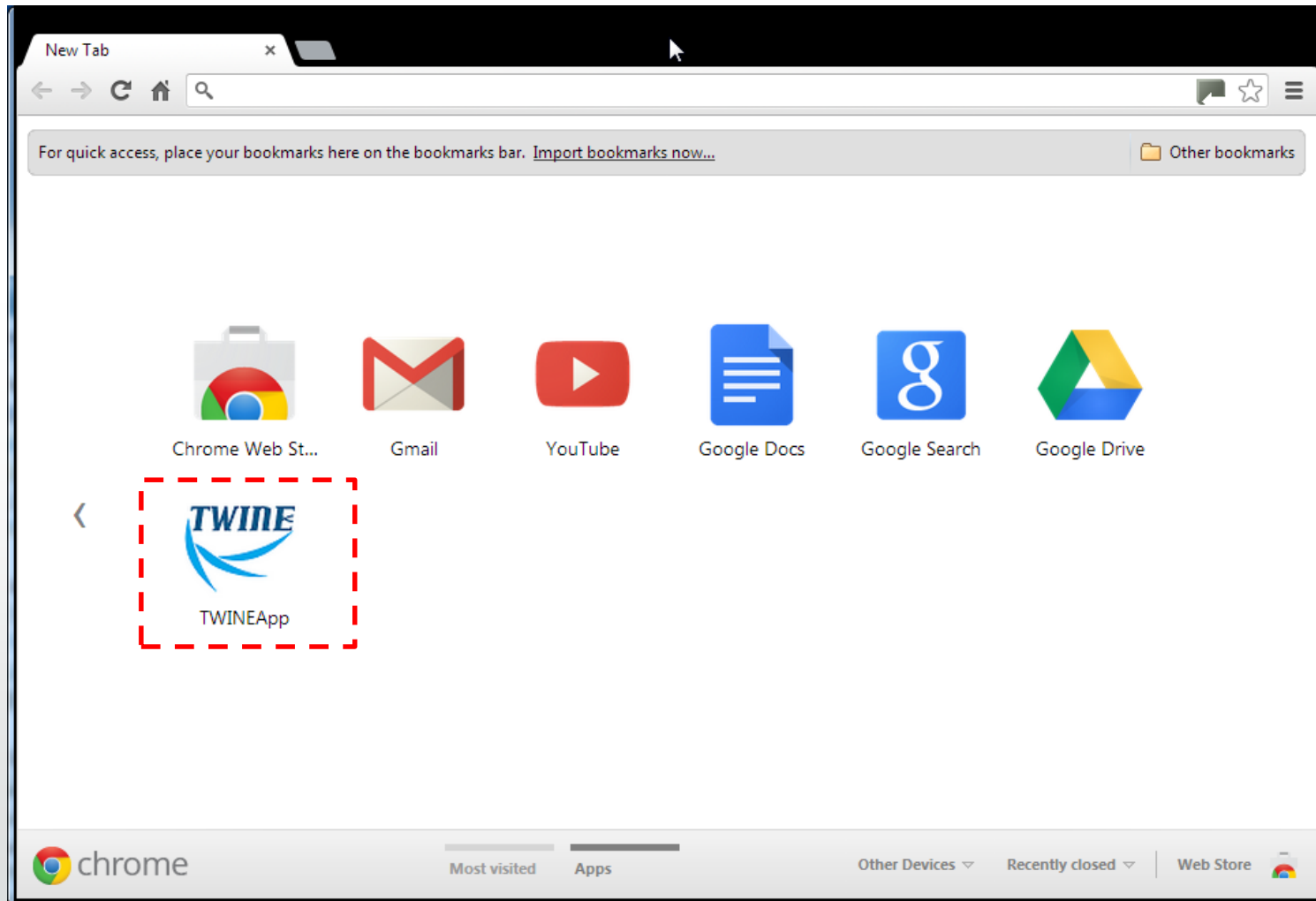
# TWINE data model



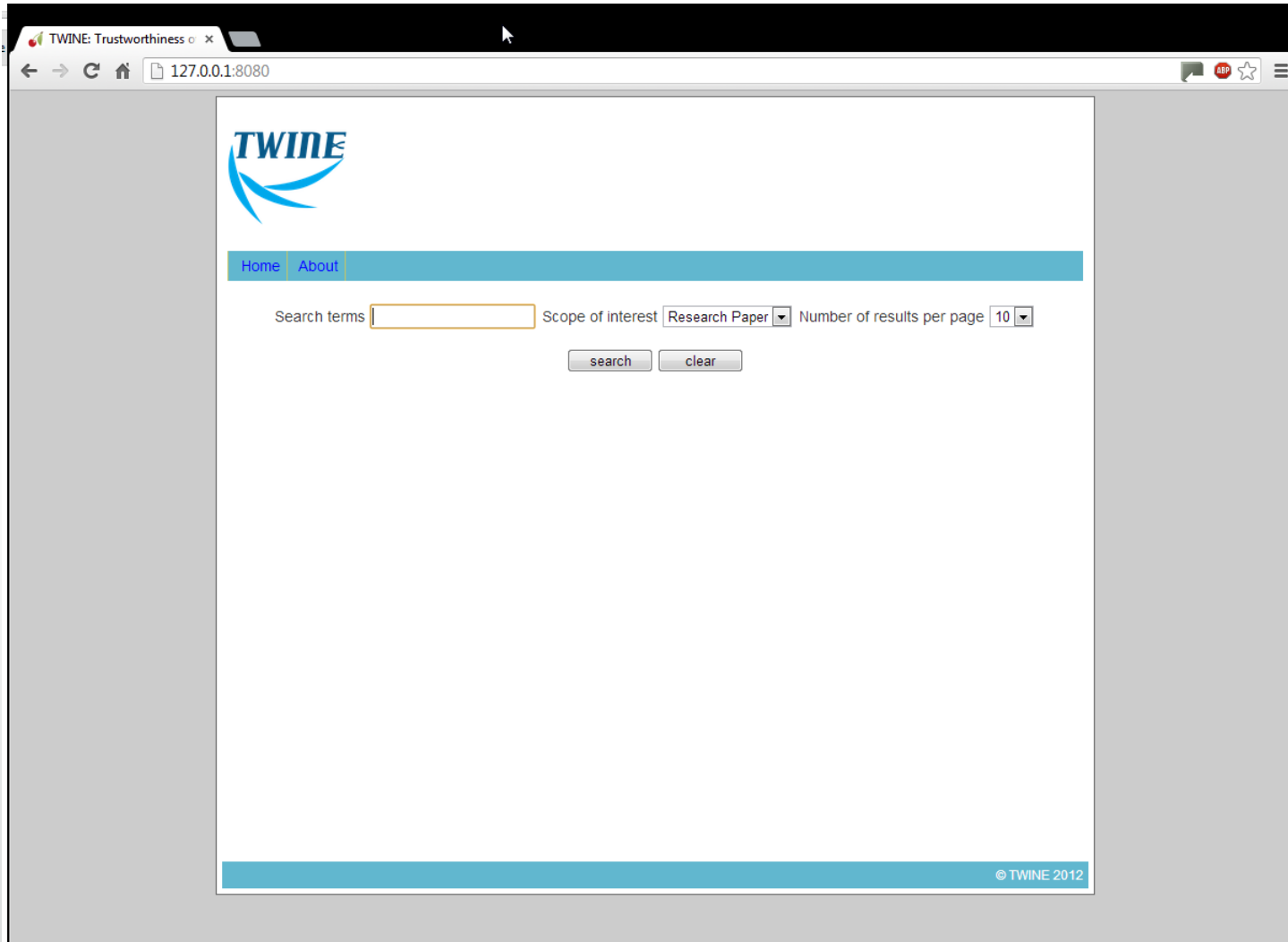
# TWINE tool (Trustworthiness of Web Information Evaluation)



# TWINE chrome extension icon



# TWINE: input interface



# TWINE: Output interface

The screenshot shows a web browser window with the TWINE logo and navigation links (Home, About). The search bar contains the term 'privacy', and the scope of interest is set to 'Research Paper'. The search results show 44 total results. The first result is 'Intimacy 2.0: Privacy Rights and Privacy Responsibilities on the World Wide Web' by Kieron O'Hara. The abstract discusses the idea of privacy in the world of 'intimacy 2.0'. The 'Trustworthy with' metric is 61.65%. The publication details are: Web Science Conference 2010, peerReviewed, published, Conference, with a link to the eprint. A table shows the file modified status for the years 2011 to 2015.

**Intimacy 2.0: Privacy Rights and Privacy Responsibilities on the World Wide Web**  
Kieron O'Hara

This paper examines the idea of privacy in the world of 'intimacy 2.0', the use of Web 2.0 social networking technologies and multimedia for the routine posting of intimate details of users' lives. It will argue that, although privacy is often conceived as a right with benefits that accrue to the individual, it is better seen as a public good, whose benefits accrue to the community in general. In that case, the costs of allowing invasions of one's privacy do not solely fall on the individual [...]

*Trustworthy with:* 61.65%  
*Published at:* Web Science Conference 2010  
*Publication status:* peerReviewed, published  
*Publication Type:* Conference  
*Publication link:* <http://eprints.soton.ac.uk/id/eprint/268760>  
*Cited by:* 2

File modified	2011	2012	2013	2014	2015
File uploaded					

**Transparent government, not transparent citizens: a report on privacy and transparency for the Cabinet Office**  
Kieron O'Hara

# Conclusion

- Identifying and providing critical supportive information helps to support the trustworthiness of Web information evaluation
  - Authority, currency, accuracy, and relevance
- Developing a framework for helping a user to evaluate the trustworthiness of Web information using proposed criteria

# QUESTIONS & ANSWERS