Extraction of Quantitative information from economic news

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April 14, 2009

Outline

- Introduction
- The Solution
- Meanwhile . . .
- The Problem
- Current state
- Further work

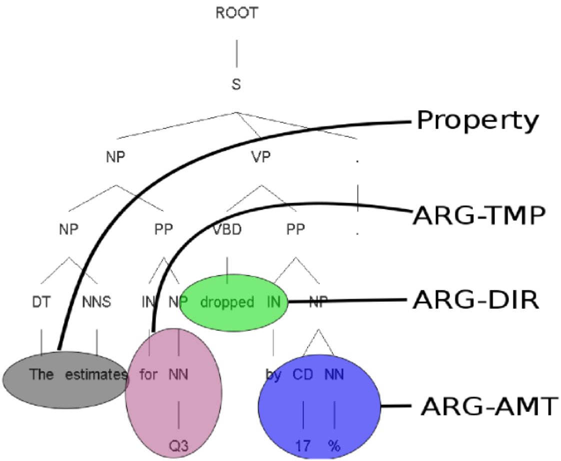
What was the problem, again?

Determine in real time from economic news:

1. Turn Over
2. Profit/Loss
3. Revenues

Can be seen as a very restricted case of a very general problem.

The exact Problem



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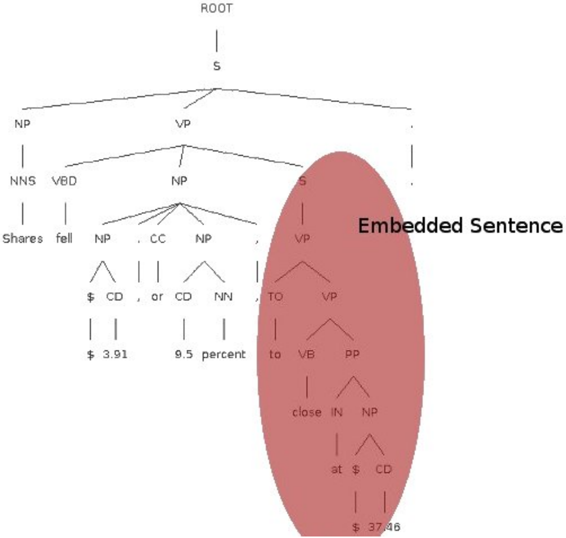
Where's the news?

The news is fetched from the web:

1. *When?*: Updates real time RSS sources
2. Yahoo Finance News
3. *What form?*: Human readable form, HTML
   - Manually designed text filter
   - However, (17%) articles have tables

Keeping it small

Breaking a sentence into simplest form.



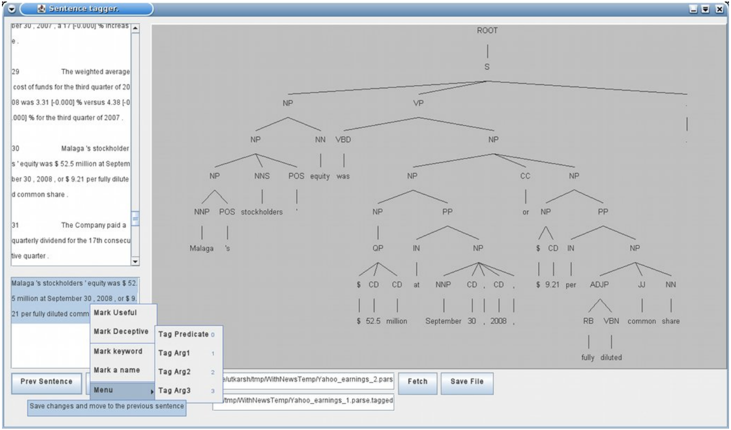
The right path

Frequency	Path	Usual Description
14.2%	$VB \uparrow VP \downarrow PP$	PP argument/adjunct
11.8%	$VB \uparrow VP \uparrow S \downarrow NP$	Subject (ARG0/ARG1)
10.1%	$VB \uparrow VP \uparrow NP$	Object (ARG0/ARG1)
...		

Table: Path from the predicate to the frame

Read/Tag/Repeat

Stanford Manual Annotator?



ber 30 , 2007 , a 17 [-0.000] % increas
e .

29 The weighted average cost of funds for the third quarter of 2008 was 3.31 [-0.000] % versus 4.38 [-0.000] % for the third quarter of 2007 .

30 Malaga 's stockholders ' equity was $ 52.5 million at September 30 , 2008 , or $ 9.21 per fully diluted common share .

31 The Company paid a quarterly dividend for the 17th consecutive quarter .

Malaga 's stockholders ' equity was $ 52.5 million at September 30 , 2008 , or $ 9.21 per fully diluted comm

e/utkarsh/tmp/WithNewsTemp/Yahoo_earnings_2.pars

/tmp/WithNewsTemp/Yahoo_earnings_1.parse.tagged

Save changes and move to the previous sentence

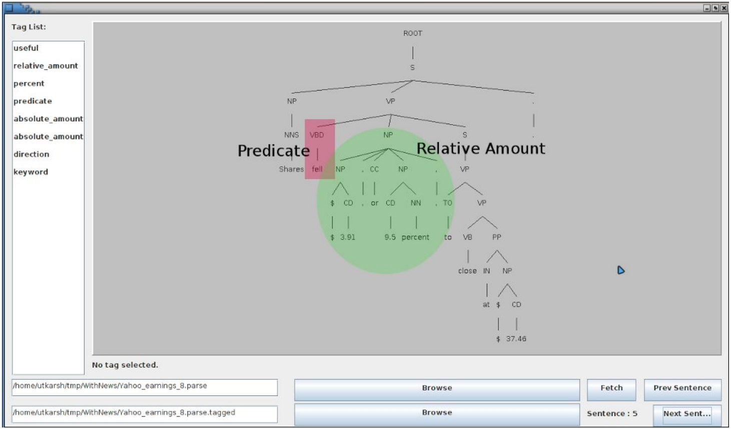
Figure: How to do it right.

What we get

```
<useful>
        <keyword>Shares</keyword>
        <direction>
                 <predicate>fell </predicate>
        </direction>
        <relative_amount>
                 <absolute_amount>$ 3.91</absolute_amount>
                 , or
                 <percent>9.5 percent</percent> ,
        </relative_amount>
</useful>
```

Putting them together

- Tregex
- Tsurgeon



No tag selected.

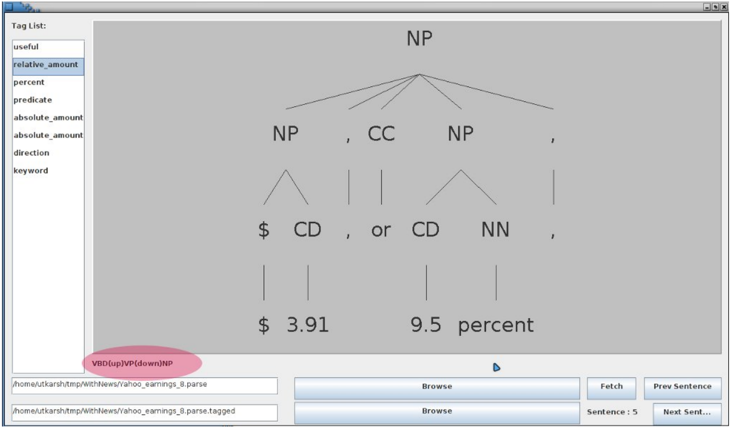
/home/utkarsh/tmp/WithNews/Yahoo_earnings_8.parse

/home/utkarsh/tmp/WithNews/Yahoo_earnings_8.parse.tagged

Sentence : 5

Figure: The whole sentence

The path



Tag List:

- useful
- relative_amount
- percent
- predicate
- absolute_amount
- absolute_amount
- direction
- keyword

VBD(up)VP(down)NP

/home/utkarsh/tmp/WithNews/Yahoo_earnings_8.parse

/home/utkarsh/tmp/WithNews/Yahoo_earnings_8.parse.tagged

Sentence : 5

Figure: A path from the *predicate* to the tag (*rel amt*)

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IB trading Olympiad

1. Direct Connection to the Internet
2. Ptolemy
3. Sectoral Arbitrage strategy

Paper in Advanced Data Analysis, Business Analytics and Intelligence conference in IIM-A.

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The Sparsity

Very sparse data:

Example

For the relation:be -> absolute_amount

`VBD(up)VP(down)NP(down)NP`: 2

`VBD(up)VP(down)PP(down)NP(down)PP(down)NP`: 1

Adding more features?

Changing stance

- Some tags discarded
- Dictionary based name extractor
- RegEx based time extractor

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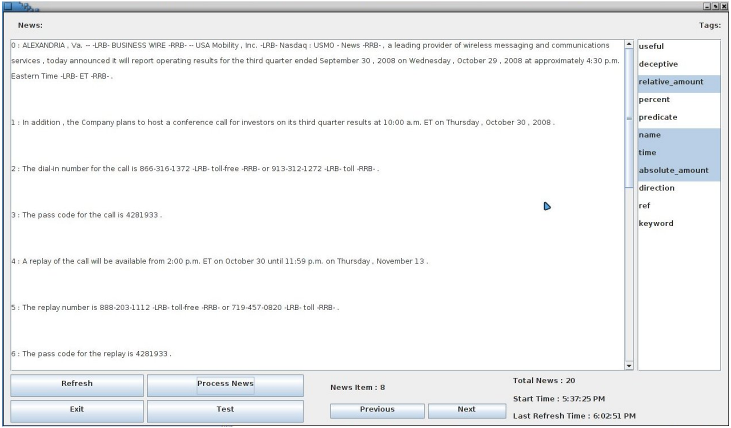
Useless news



News:

0 : ALEXANDRIA , Va. -- -LRB- BUSINESS WIRE -RRB- -- USA Mobility , Inc. -LRB- Nasdaq : USMO - News -RRB- , a leading provider of wireless messaging and communications services , today announced it will report operating results for the third quarter ended September 30 , 2008 on Wednesday , October 29 , 2008 at approximately 4:30 p.m. Eastern Time -LRB- ET -RRB- .

1 : In addition , the Company plans to host a conference call for investors on its third quarter results at 10:00 a.m. ET on Thursday , October 30 , 2008 .

2 : The dial-in number for the call is 866-316-1372 -LRB- toll-free -RRB- or 913-312-1272 -LRB- toll -RRB- .

3 : The pass code for the call is 4281933 .

4 : A replay of the call will be available from 2:00 p.m. ET on October 30 until 11:59 p.m. on Thursday , November 13 .

5 : The replay number is 888-203-1112 -LRB- toll-free -RRB- or 719-457-0820 -LRB- toll -RRB- .

6 : The pass code for the replay is 4281933 .

Tags:

useful
deceptive
relative_amount
percent
predicate
name
time
absolute_amount
direction
ref
keyword

News Item : 8

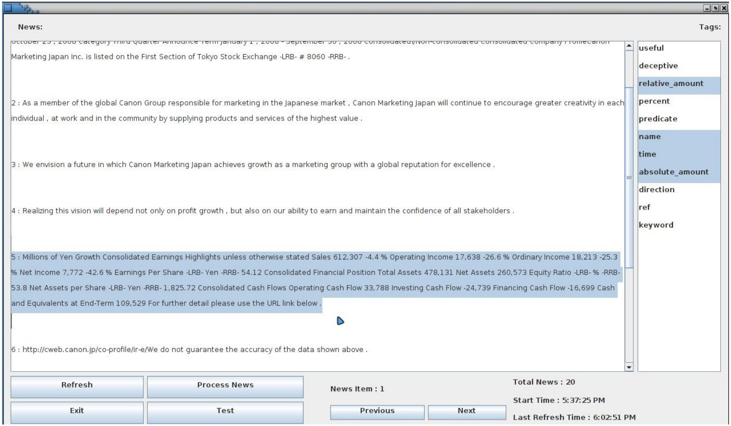
Total News : 20

Start Time : 5:37:25 PM

Last Refresh Time : 6:02:51 PM

Figure: No useless news

Unparsed news



October 23 , 2008 Category Third Quarter Announce Term January 1 , 2008 - September 30 , 2008 Consolidated/Non-consolidated Consolidated Company ProfileCanon Marketing Japan Inc. is listed on the First Section of Tokyo Stock Exchange -LRB- # 8060 -RRB- .

2 : As a member of the global Canon Group responsible for marketing in the Japanese market , Canon Marketing Japan will continue to encourage greater creativity in each individual , at work and in the community by supplying products and services of the highest value .

3 : We envision a future in which Canon Marketing Japan achieves growth as a marketing group with a global reputation for excellence .

4 : Realizing this vision will depend not only on profit growth , but also on our ability to earn and maintain the confidence of all stakeholders .

5 : Millions of Yen Growth Consolidated Earnings Highlights unless otherwise stated Sales 612,307 -4.4 % Operating Income 17,638 -26.6 % Ordinary Income 18,213 -25.3 % Net Income 7,772 -42.6 % Earnings Per Share -LRB- Yen -RRB- 54.12 Consolidated Financial Position Total Assets 478,131 Net Assets 260,573 Equity Ratio -LRB- % -RRB- 53.8 Net Assets per Share -LRB- Yen -RRB- 1,825.72 Consolidated Cash Flows Operating Cash Flow 33,788 Investing Cash Flow -24,739 Financing Cash Flow -16,699 Cash and Equivalents at End-Term 109,529 For further detail please use the URL link below .

6 : http://cweb.canon.jp/co-profile/ir-e/We do not guarantee the accuracy of the data shown above .

News Item : 1

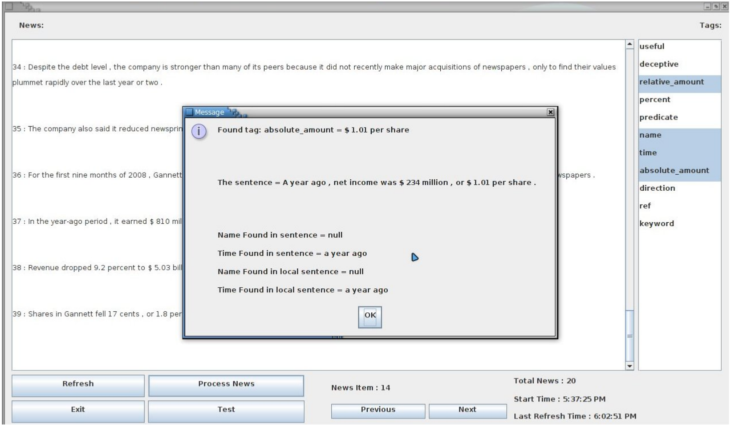
Total News : 20

Start Time : 5:37:25 PM

Last Refresh Time : 6:02:51 PM

Figure: No unparsed news

Absolute amount



News:

34 : Despite the debt level , the company is stronger than many of its peers because it did not recently make major acquisitions of newspapers , only to find their values plummet rapidly over the last year or two .

35 : The company also said it reduced newsprin

36 : For the first nine months of 2008 , Gannett … wspapers .

37 : In the year-ago period , it earned $ 810 mil

38 : Revenue dropped 9.2 percent to $ 5.03 bill

39 : Shares in Gannett fell 17 cents , or 1.8 per

Message

Found tag: absolute_amount = $ 1.01 per share

The sentence = A year ago , net income was $ 234 million , or $ 1.01 per share .

Name Found in sentence = null

Time Found in sentence = a year ago

Name Found in local sentence = null

Time Found in local sentence = a year ago

News Item : 14

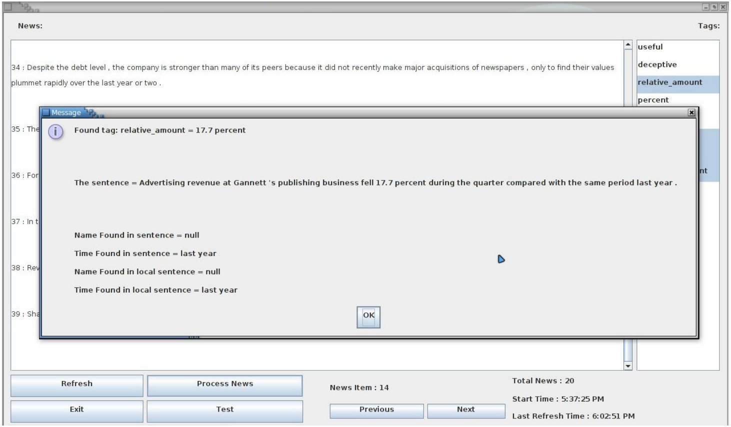
Total News : 20

Start Time : 5:37:25 PM

Last Refresh Time : 6:02:51 PM

Figure: Absolute Amount

Relative amount



34 : Despite the debt level , the company is stronger than many of its peers because it did not recently make major acquisitions of newspapers , only to find their values plummet rapidly over the last year or two .

35 : The

36 : For

37 : In t

38 : Rev

39 : Sha

Found tag: relative_amount = 17.7 percent

The sentence = Advertising revenue at Gannett 's publishing business fell 17.7 percent during the quarter compared with the same period last year .

Name Found in sentence = null

Time Found in sentence = last year

Name Found in local sentence = null

Time Found in local sentence = last year

News Item : 14

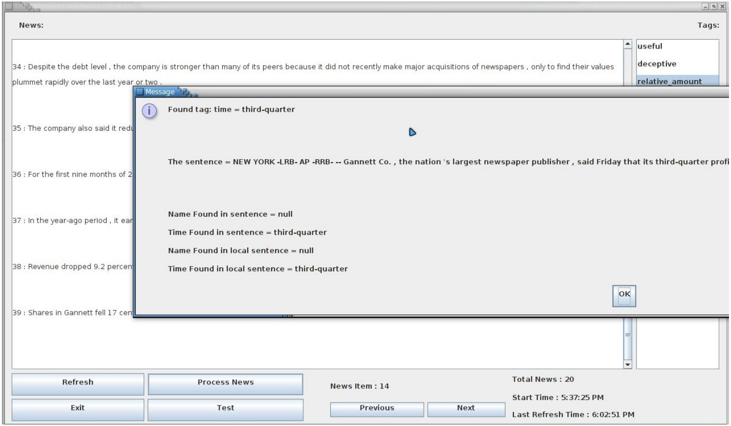
Total News : 20

Start Time : 5:37:25 PM

Last Refresh Time : 6:02:51 PM

Figure: Relative Amount

Not as helpless



News:

Tags:

34 : Despite the debt level , the company is stronger than many of its peers because it did not recently make major acquisitions of newspapers , only to find their values plummet rapidly over the last year or two .

35 : The company also said it redu

36 : For the first nine months of 2

37 : In the year-ago period , it ear

38 : Revenue dropped 9.2 percen

39 : Shares in Gannett fell 17 cen

useful

deceptive

relative_amount

Message

Found tag: time = third-quarter

The sentence = NEW YORK -LRB- AP -RRB- -- Gannett Co. , the nation 's largest newspaper publisher , said Friday that its third-quarter profi

Name Found in sentence = null

Time Found in sentence = third-quarter

Name Found in local sentence = null

Time Found in local sentence = third-quarter

OK

Refresh | Process News

Exit | Test

News Item : 14

Previous | Next

Total News : 20

Start Time : 5:37:25 PM

Last Refresh Time : 6:02:51 PM

Figure: Same time references

Maintainers are psychopathic killers

- NetBeans
- GUI
- JavaDoc
- JUnit testing

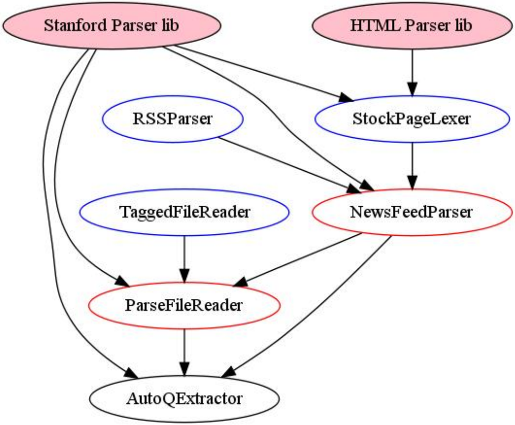


Figure: Dependency Tree of the project

Outline

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Further work

Next rung. . .

1. More data
2. Fixing temporal references, Grammatical dependency
3. HTML text extraction
4. Knowledgebase
5. Finer classification, discarded information

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Introduction
Problem Statement
The Solution
The collection
The simplification
The aim
The manual tagging
The combination
Meanwhile . . .
The Problem
Modifications
Current state
Functioning
Code
Further work

Thank you

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