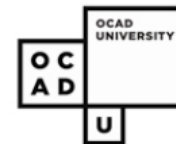


Enhanced Analysis & Visualization of Text



Wednesday, October 19, 2011
A CIV/DDD Demonstration Project with RBC

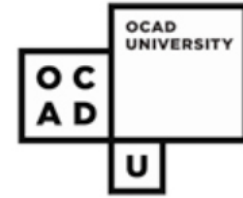




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Martin Dimkovski



Symon Oliver



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Research Objectives

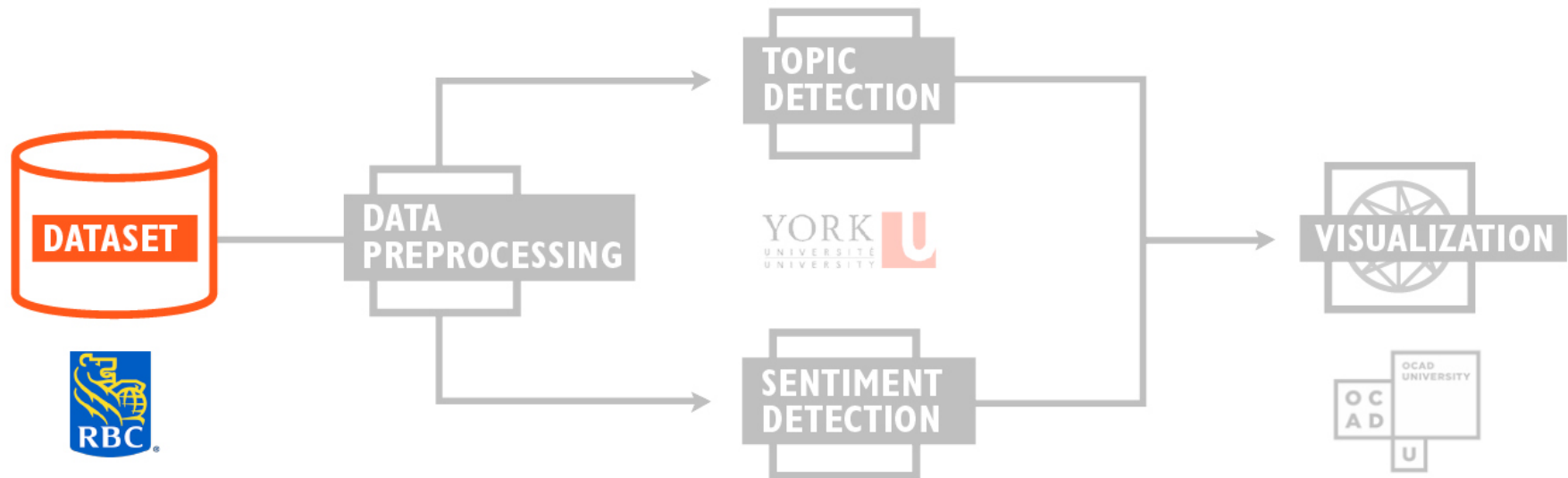
DATA MINING

- Topic detection
- Capture public sentiments
- Root cause analysis on sentiments
- Analyze data to inform business decisions

VISUALIZATION

- Ability to analyze each individual bank
- Ability to compare across different banks
- Interactive visualization

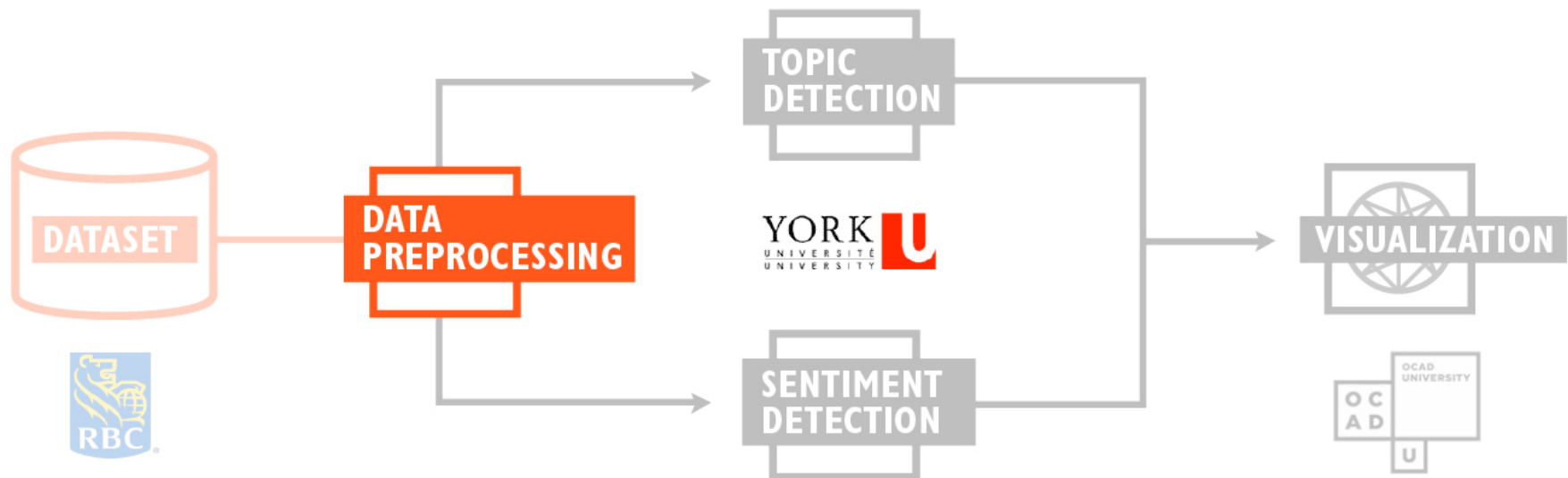
Project Pipeline | Dataset



Dataset | RBC Sample Spreadsheet

	Topic	Sentiment	Author	Title	Source Type	Comments				
	A	B	C	D	E	F	G	H	I	J
6709	CIA RBC ALL	neutral	marketmaker	CIBC, Laurent	blog	Laurentian Bank lowered some of its fixed mortgage rates on Tuesday, fo				
6710	CIA RBC ALL	neutral	skentmoore	RT @withersct	micro	RT @witherscbc: This am Dexter Govt orders 8 municipalities in South W				
6711	CIA RBC ALL	negative	Mike_Allen47	Minister @Linc	micro	Minister @LindsayBlackett presents 125,000 to FM Historical Society for r				
6712	CIA RBC ALL	neutral	Madhav	Drop in mortg	news	Canada's big banks have cut their residential mortgage rates, likely for				
6713	CIA RBC ALL	neutral	DivaMode24	@arieg24209	micro	@arieg24209 gal u hear some one else die at royal bank this morning				
6714	CIA RBC ALL	neutral	Witherscbc	This am Dexte	micro	This am Dexter Govt orders 8 municipalities in South West Nova to pay R				
6715	CIA RBC ALL	neutral	lamsik	RT @calgaryhe	micro	RT @calgaryherald: Royal Bank, TD lower residential mortgage rates http				
6716	CIA RBC ALL	neutral	Wayne	Wayne Campb	blog	With the Bank of Canada now widely expected to hold off on a rate hike				
6717	CIA RBC ALL	neutral	Melissa Kost-R	Royal Bank, TI	micro	The Royal Bank of Canada, TD Canada Trust and Bank of Nova Scotia all				
6718	CIA RBC ALL	neutral	info	05/30/2011 1t	blog	05/30/2011 16:14 CHINA China unable to guarantee the safety of its nu				
6719	CIA RBC ALL	positive	tattoodesigne	Targets cut on	micro	Targets cut on Royal Bank				
6720	CIA RBC ALL	negative	Kelly McParlan	Kelly McParlan	blog	Ever since				
6721	CIA RBC ALL	neutral	info	China Stock N	blog	China Stock News: Inflation And Auto Sales Beijing newspaper hails saf				
6722	CIA RBC ALL	neutral	info	China?s Econo	blog	China's Economy Slows, but Inflation Still Looms Beijing newspaper hail				
6723	CIA RBC ALL	positive	Yona Fares Ma	NAOMBAKAZI.	blog	The School of Business at Grant MacEwan University is seeking a full-tir				
6724	CIA RBC ALL	neutral	LakesoMuirfiel	RT @calgaryhe	micro	RT @calgaryherald: Royal Bank, TD lower residential mortgage rates http				
6725	CIA RBC ALL	neutral	Onestop Ones	Royal Bank, TI	micro	admin Calgary Herald				
6726	CIA RBC ALL	neutral	MikeFotiou	RT @JustinHav	micro	RT @JustinHavre: Good news for Buyers - Royal Bank, TD lower residenti				
6727	CIA RBC ALL	neutral	ArtLeeRealtor	Royal Bank, TI	micro	Royal Bank, TD lower residential mortgage rates http://ow.ly/2brZ6F Sp				
6728	CIA RBC ALL	neutral	CalgarysAgent	Royal Bank, TI	micro	Royal Bank,				
6729	CIA RBC ALL	neutral	Matt Verity-Re	Royal Bank, TI	micro	The Royal Bank of Canada, TD Canada Trust and Bank of Nova Scotia all				
6730	CIA RBC ALL	neutral	EdmRealtor	Royal Bank, TI	micro	Royal Bank, TD lower residential mortgage rates. http://ow.ly/5619V				
6731	CIA RBC ALL	mixed	Michael Babad	Restructuring	news	These are stories Report on Business is following Monday, May 30. Get tl				
6732	CIA RBC ALL	mixed	Michael Babad	Restructuring	news	These are stories Report on Business is following Monday, May 30. Get tl				
6733	CIA RBC ALL	neutral	wholesalegurri	Targets cut on	micro	Targets cut on Royal Bank: _Much of the weakness can be explained by v				

Project Pipeline | Data Preprocessing

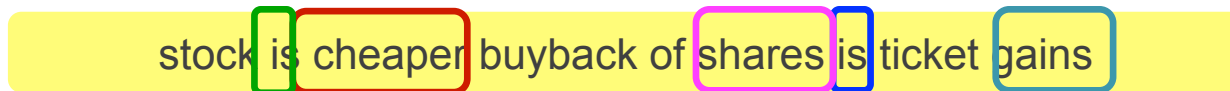


When the stock is cheaper, a buyback of shares is the ticket to gains.

Part Of Speech Tagging



Stop Word Removal



Stemming



Topic Detection | Methodology

Topics

CIBC	0.0551
opening	0.0080
branch	0.0072
centre	0.0069
new	0.0066

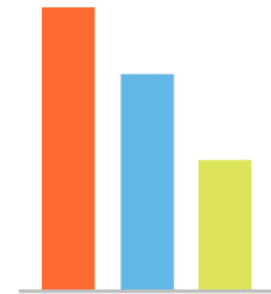
banking	0.0062
grand	0.0044
celebrate	0.0040
donation	0.0037

exdividend	0.0037
foundation	0.0037

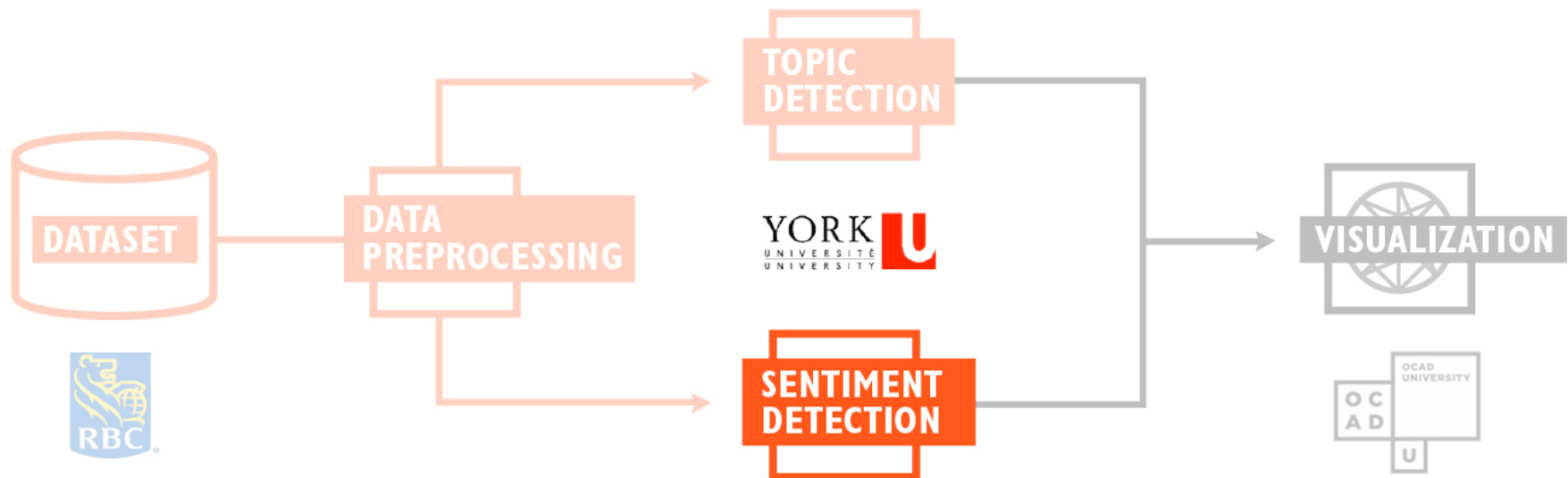
Documents

Topic	Title
CIA RBC	When the stock is cheaper, a buyback of sh...
CIA RBC	The Wickedness Behind Most 21st-Century...
CIA RBC	@ Royal Banking
CIA RBC	If you were planning on buying at the street...
CIA RBC	Thank you to #Saskatchewan Chamber of C...
CIA RBC	The Hidden Cost of Cutting The Mortgage
CIA CIBC	@aBipolarBadger Do you know if the Visa...
CIA CIBC	cibc sucks!
CIA CIBC	New Mortgage Reviews
CIA CIBC	RT @sdd CIBC Poll: Fixed or Variable? 25%...
CIA CIBC	Mixed Canadian data foundation highlights...
CIA CIBC	- Market Call Summary opening
...	...

Topic Proportions



Project Pipeline | Sentiment Detection



SentiMAP

- Sentiment and eMotion Analysis Platform



EXTRACT FEATURES FROM RBC DATASET

People & Organization Names

- Canada spokesman Jeremy Harrison; Andrew Pyner ...
- MBNA; National Bank ...

Events

- CFIB and Scotiabank Internship; Fund-raising dinner ...
- IMF resigns debate; Japan earthquake ...

Terms

- Currency conversion fees; Age bracket ...
- Copper gold Porphyries, ATM operator fees ...

Products

- CIBC Aeroplan Infinite; Death insurance ...
- Email money transfer; Flight delay and luggage insurance ...

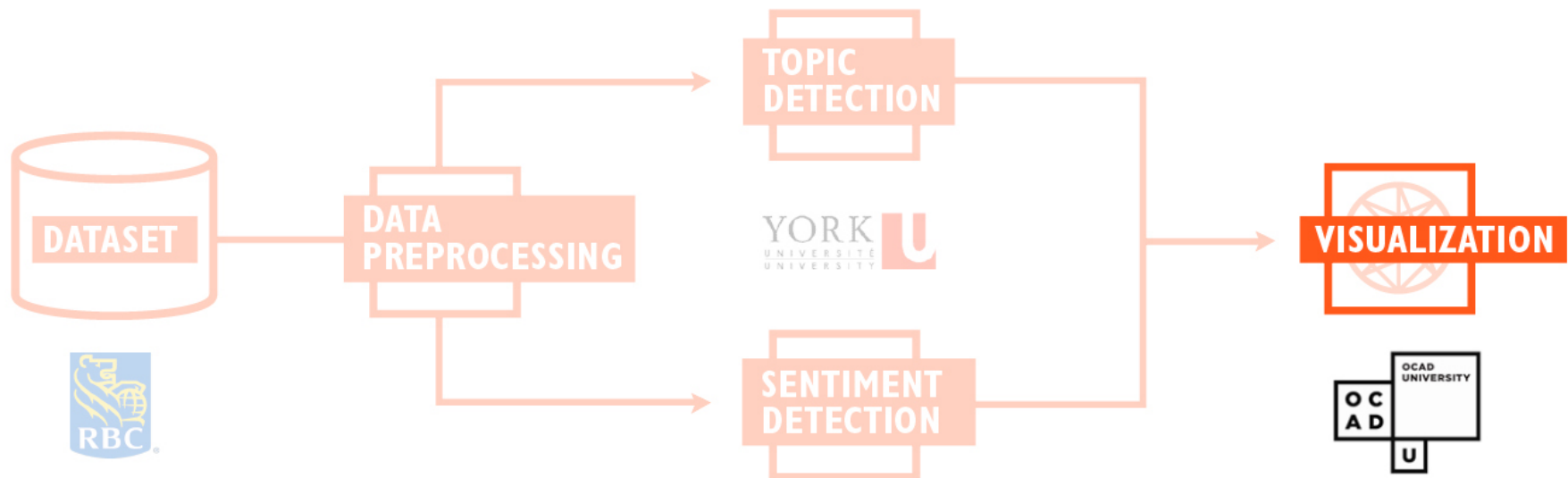
SENTIMAP RESULTS

- Sentiment labels along with Emotions

RBC Label	SentiMAP label	With Emotion	sentences
neutral	positive	LOVE	nauru is right RBC Access USA is an absolutely fantastic product but it s probably no
neutral	positive	SUPRISE	yes right now i use smart cash for my daily purchase just somehow for some reason
neutral	neutral	Neutral	why cant it be td or cbc or scotia
neutral	neutral	Neutral	or is this for waiving fees for your bank account
neutral	negative	ANGER	I recall some worked for CIBC sued them for not paying overtime they ve made head
neutral	positive	JOY	yeah lol to be honest I just want to bank with RBC because they are the 1 bank in Ca
neutral	neutral	Neutral	When you contact us we will provide you with two ways to file your complaint Call
neutral	neutral	Neutral	I don't know enough about it to make any definitive comment about Interac Online
neutral	neutral	Neutral	The most I could see is the timeframe has not yet been defined or is defined on a p
neutral	neutral	Neutral	Well I just called CIBC to make sure They said that there would be no change for me
neutral	neutral	Neutral	That is correct there is certain criteria it must meet to be branded World One intere
neutral	neutral	Neutral	will non CitiCard clients be able to apply for any of these cards soon probably after:
neutral	negative	SADNESS	I think they will upgrade the benefits of Driver s Edge World since I am pretty sure M

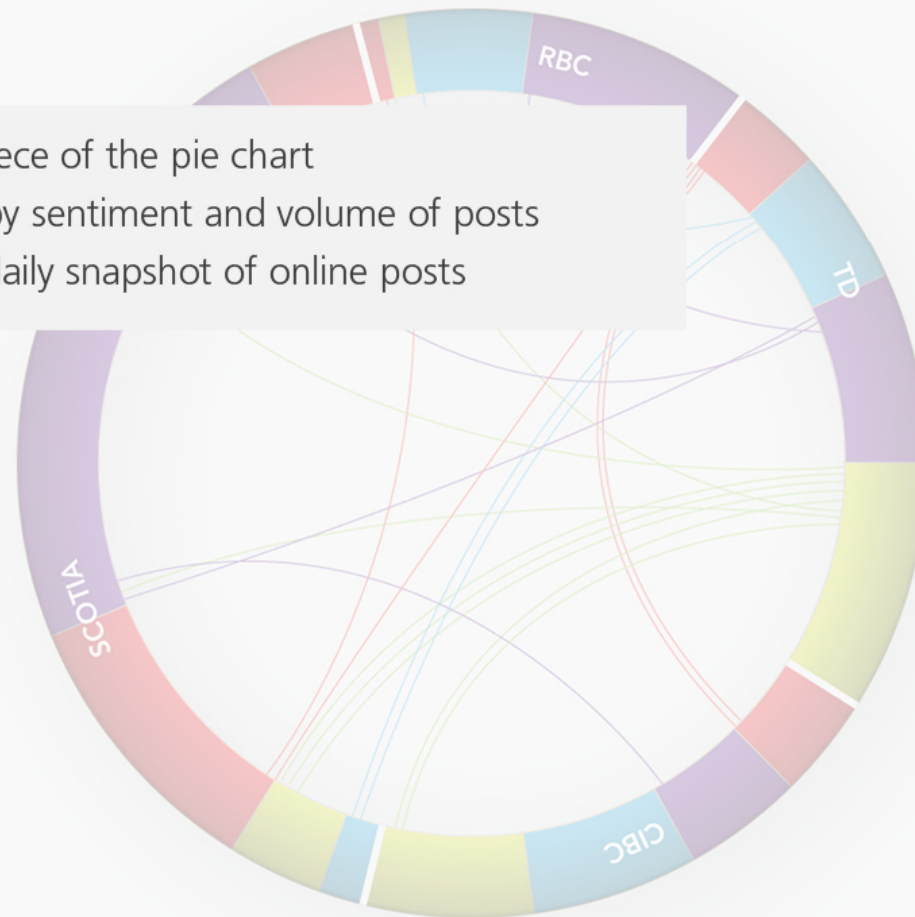
→ High frequency of sentiment mislabelling in RBC dataset

Project Pipeline | Visualization

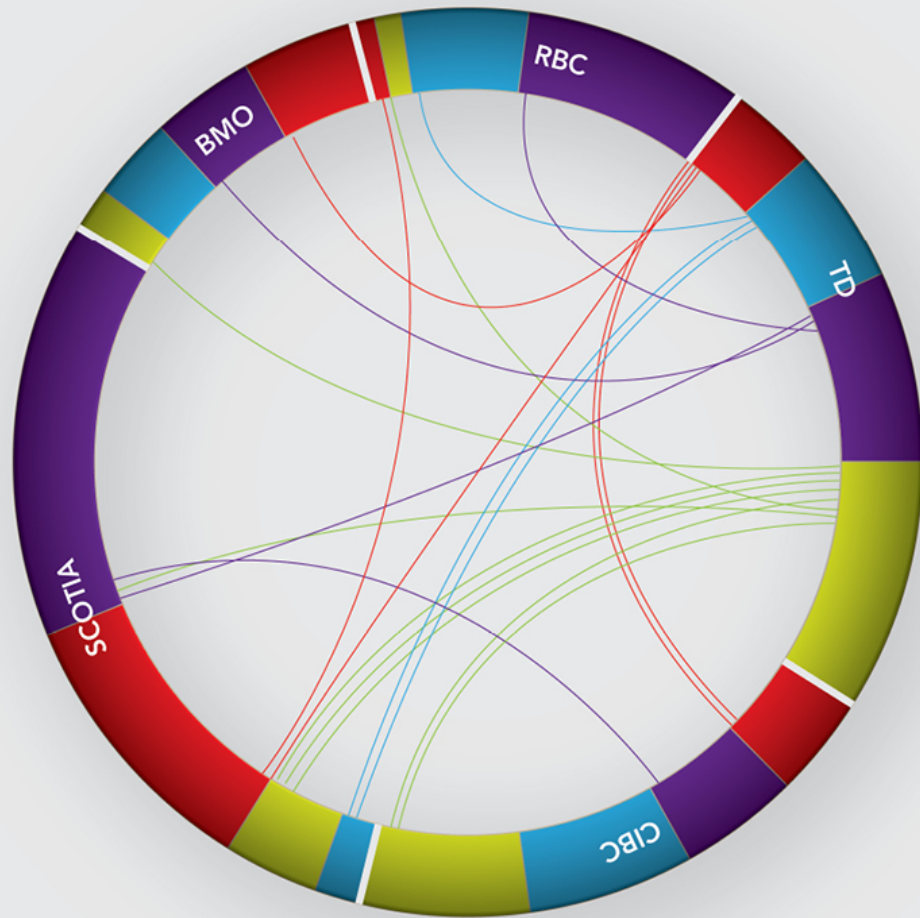


Visualization | Sentiment Wheel

- Each bank shares a piece of the pie chart
- Compare each bank by sentiment and volume of posts
- Visualization takes a daily snapshot of online posts



DAY
19 MAY 2011



III

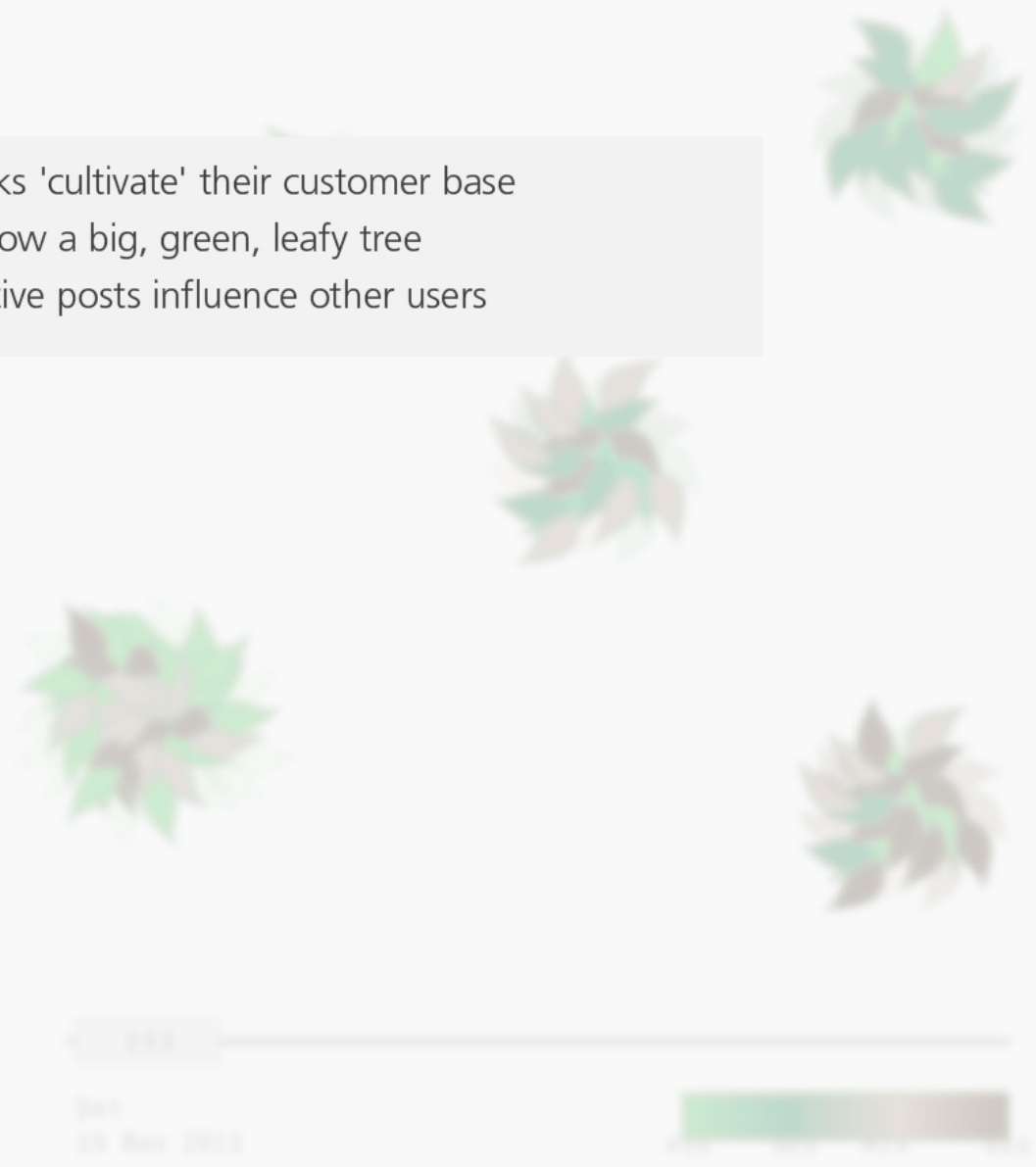
DAY
19 MAY 2011

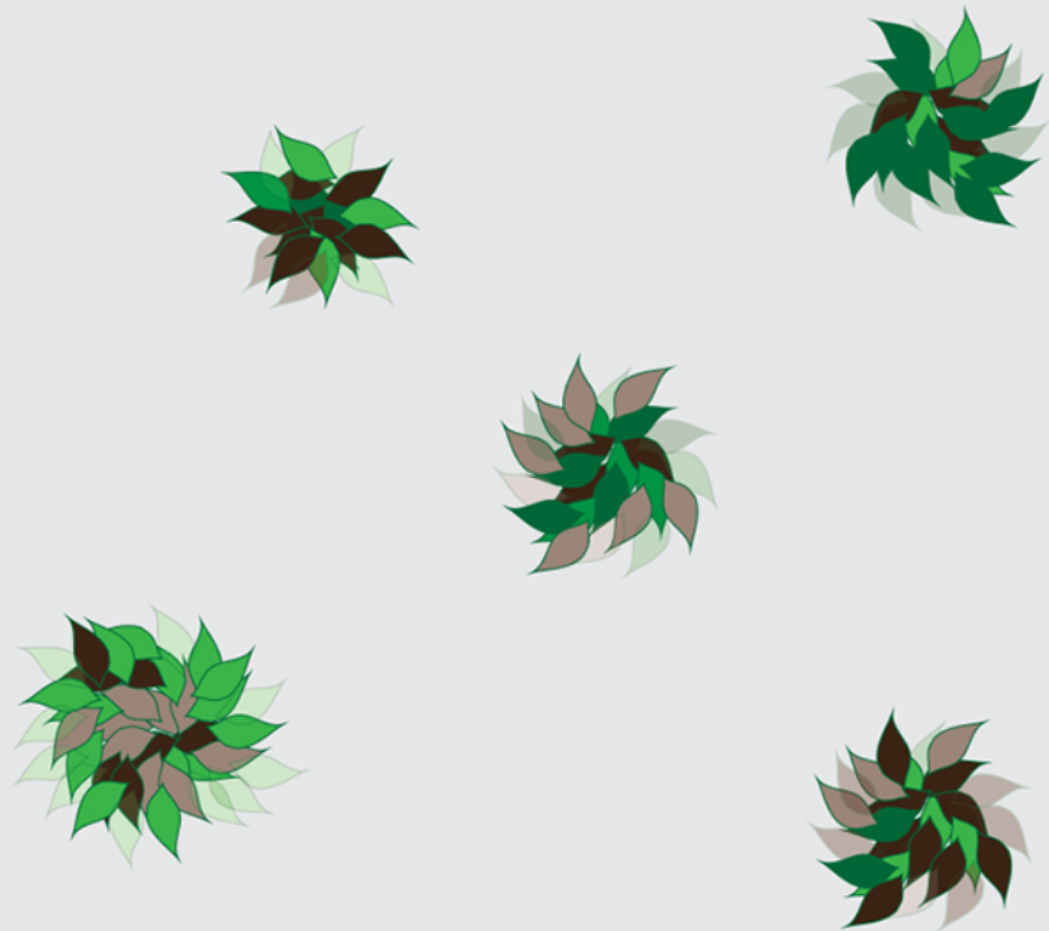


DAY
19 MAY 2011

Visualization | Money Tree

- Watch how banks 'cultivate' their customer base
- The goal is to grow a big, green, leafy tree
- Observe if negative posts influence other users





III

DAY
19 MAY 2011





III

DAY

19 MAY 2011

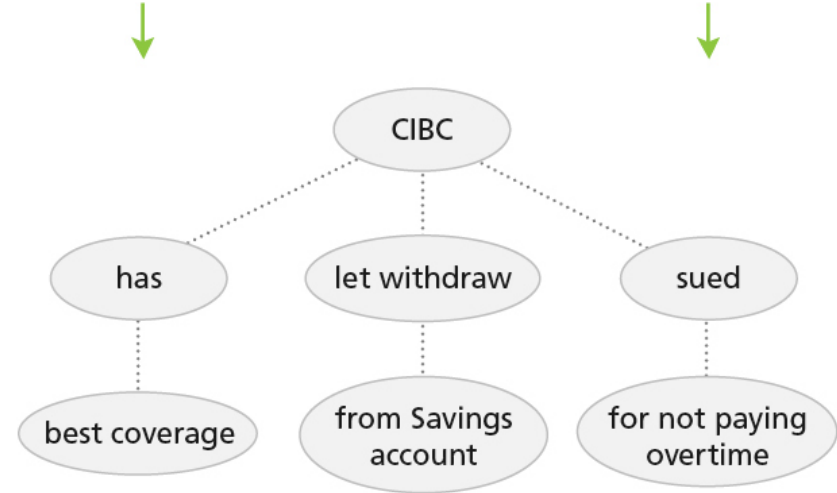
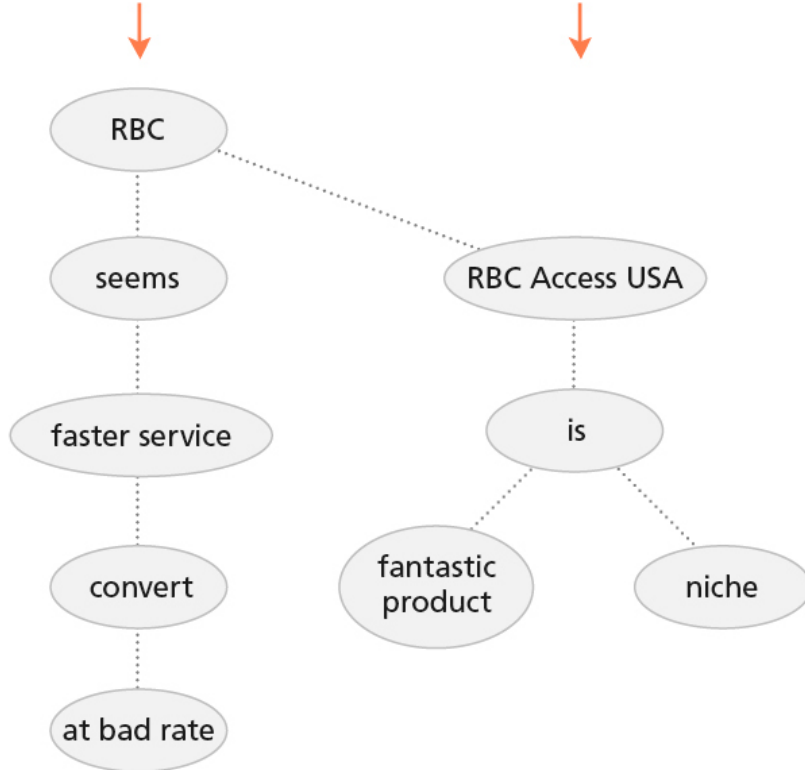
Visualization | Concept Graphs

RBC seems to have faster service plus they have USD ABMs. It seems that RBC is putting USD in more of its ATMs but only if your convert at their bad rates.

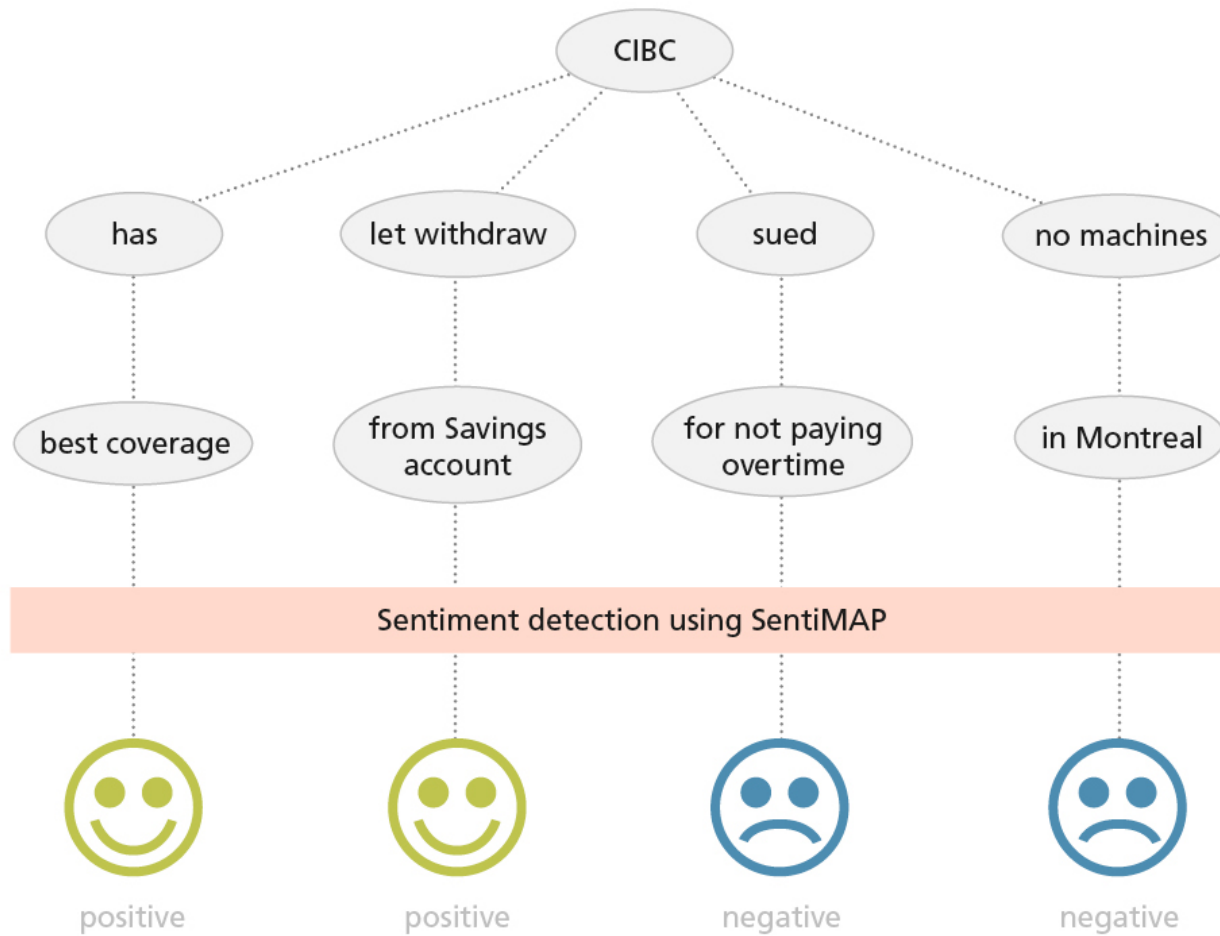
RBC Access USA is an absolutely fantastic product but it is probably not something OP needs. It is a bit niche.

I recall some worked for CIBC sued them for not paying overtime they've made headlines what happened to them?

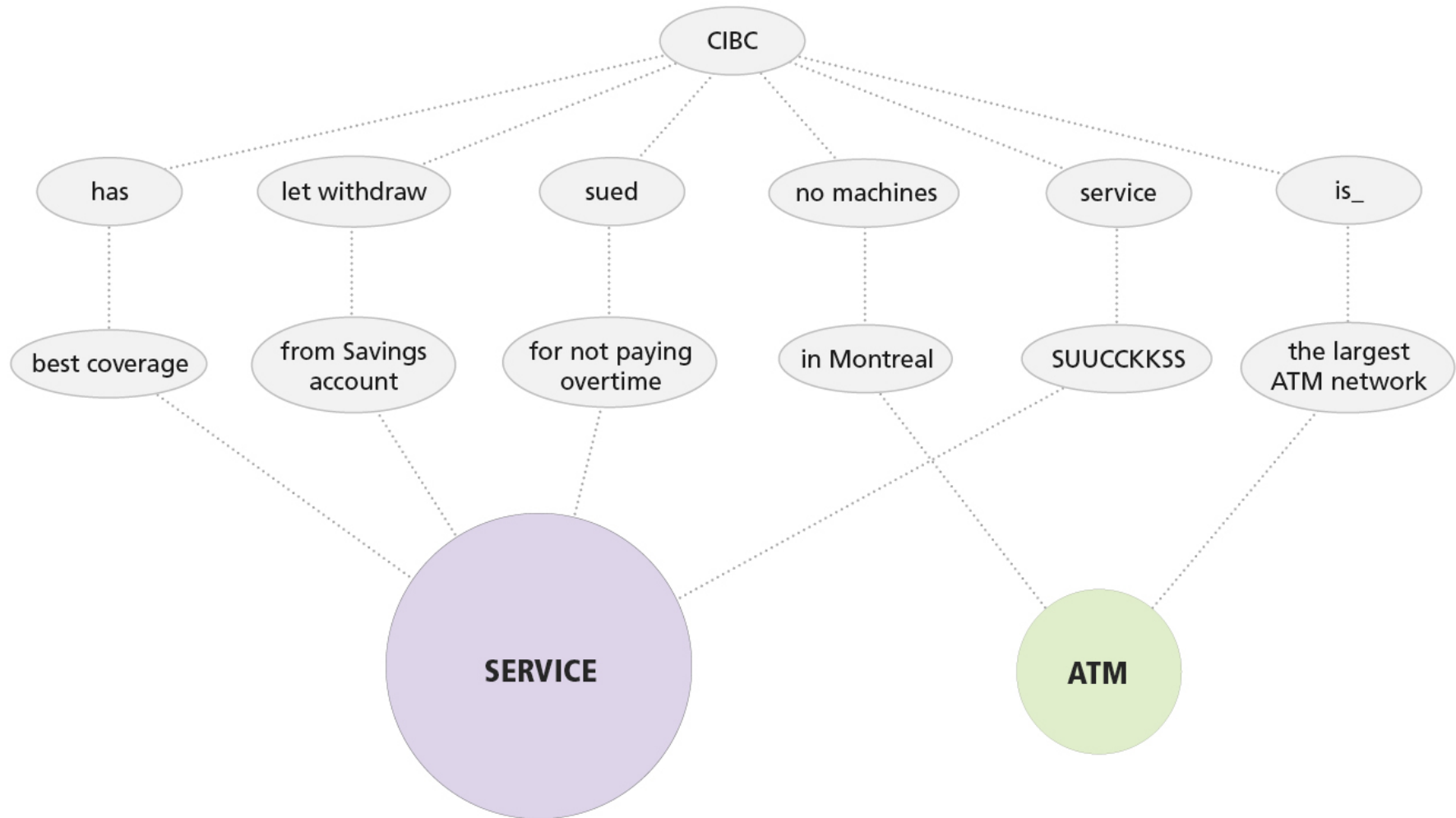
CIBC still has the best coverage in terms of USD ATMs and they let your withdraw from their US Savings accounts too.



Visualization | Applying SentiMap on Concept Graphs



Visualization | Clustering Concepts



CONTEXT-BASED SEARCH & SENTIMENT LABELLING

- Alerts for emerging topics and when certain topics gain leading interest
- Conduct surveys for manual labelling
- Determine correlations between topics and sentiments

VISUALIZATION

- Appropriateness of 2D/3D visualizations
- Focus on interaction design
- Dashboard strategy VS others

Questions? | civ-ddd.wikispaces.com