



Optimizing Information Acquisition and Decision Making Processes with Natural Language Processing, Machine Learning & Visual Analytics

Albert Weichselbraun, Philipp Kuntschik
Norman Süsstrunk, Fabian Odoni,
Sandro Hörler, Adrian Brasoveanu



Agenda

Introduction

- Challenges
- Technology stack

Visual analytics

Industry use cases

- Digital Asset Management (IMAGINE)
- Company Valuation (DISCOVER)
- Recruiting (Job Cockpit)

Conclusions

Introduction

Technical challenges (Text & Data Mining)

- Application of statistics, natural language processing and machine learning
- Knowledge poor, but predictable, well described methods
- Data quality, reliability

Economic & domain-specific challenges

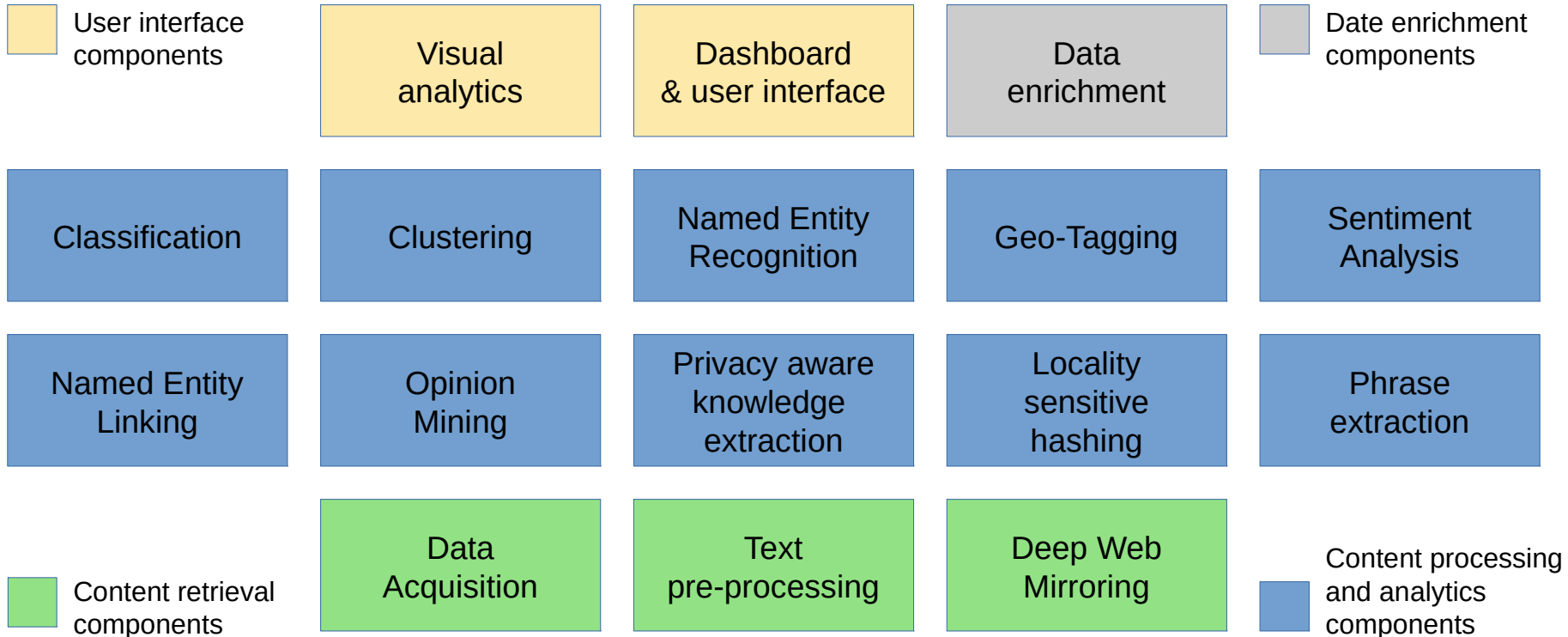
- “Enabling sciences”
 - ✓ support domain experts in creating more efficient processes and new innovative products
 - ✓ visual analytics can aid decision makers in identifying potential applications of these methods
- Create value
 - ✓ optimize business processes
 - ✓ new product and services

Introduction

i **AGINE**

DISCOVER

 **JobCockpit**



webLyzard
technology

wisdom
project

COMET

RMCS



HTW Chur



Hochschule für Technik und Wirtschaft
University of Applied Sciences

Visual Analytics

Big Data & Web Intelligence

Swiss Media
CRITICISM

Hilfe | Abmelden

billag

Dokumente

0-50 von 1798

Zeitraum

15 Dez. 2017 - 15 Mrz. 2018

Datenquellen

Massenmedien

Interface-Optionen

Ungefiltert

Visualisierungen

Export

TOPICS

Medien

Tagblatt

2882

SRF

1626

SRG

1604

Blick

1154

20min

456

NZZ

327

Weltwoche

245

Südostschweiz

90

Abfragen

Universitäten

Lügenpresse

Medien

Töpfevergleich

Themenvorschläge

Neue Kategorie hinzufügen

frequency

Anteil pro Thema

Dezember, 2017

M	D	M	D	F	S	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

März, 2018

M	D	M	D	F	S	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

Auswahl eines individuellen Zeitintervalls (links) oder der jeweils letzten 1-6 Wochen bzw. Monate (unten).

Wochen

Monate

1

2

3

4

5

6

Abbrechen

Übernehmen

AKTUELLE SUCHE

billag

1798

ASSOZIATIONEN

kessler

223

leuthard

518

bigler

95

reaktionen

479

hintergründe

127

no-billag-initiative

1212

blum

180

marchand

237

abstimmung

770

projer

121

ticker

168

srg

1604

libertären

91

strafanzeige

119

befürworter

203

11-03

Brotz' Lohn-Enthüllung machte SRF-Direktor nervös

Lohn-Enthüllung machte SRF-Direktor nervös. Im Vorfeld der No-Billag-Initiative hat Rundschau-Moderator...

berneroberlaender.ch

11-03

Krampfpause nach «No Billag» - NZZ

nach «No Billag» | NZZ. Kolumne. Krampfpause nach «No Billag». Eine Lehre der «No Billag»-Abstimmung ist...

nzz.ch

11-03

Radio Rottu Oberwallis

haben "Nein, aber" gestimmt. Ein prominenter Unterstützer der No-Billag-Initiative war der Schweizerische ...

rro.ch

11-03

Nick Lüthi über No Billag - Radio 32

Lüthi über No Billag - Radio 32. Nick Lüthi arbeitet seit 1995 als Journalist für Print, Radio und Online. Im G...

radio32.ch

10-03

Lernen von der Schweiz

Woche war die Schweiz erneut mediales Vorbild. Vor der «No Billag»-Abstimmung zweifelten deutsche Jour...

badenertagblatt.ch

10-03

Lernen von der Schweiz

Woche war die Schweiz erneut mediales Vorbild. Vor der «No Billag»-Abstimmung zweifelten deutsche Jour...

oltner-tagblatt.ch

ablehnung

absender

abstimmung

abstimmungen

abstimmungskampf

alleine

argumenten

bakom

baustelle

beanstandung

befürworter

bekenntnis

betrag

bigler

blum

bundesrat

cina

delegierten

departements

emotionalsten

entscheidung

entwurf

fahrer

fernsehwerbung

gebühreneinnahmen

gegner

gewerbeverband

giacobbo

gujer

heimgartner

hinfällig

hintergründe

hochrechnung

initiant

initianten

initiative

innovation

jüngere

kessler

kleeb

konturen

konzession

köppel

lanz

leuthard

libertären

live

lombardi

marchand

methode

moesch

nobillag

projer

reaktionen

reform

reformbedarf

reusser

rickli

rundfunk

rytz

senkung

sgv

sonntagszeitung

spot

sprachregionen

srg

staatsmedien

stellenabbau

stimmenden

stimmvolk

strafanzeige

stärke

telesuisse

telezüri

tessiner

ticker

untergang

verfasser

werbeverbot

yanez

zentraler

zimmermann

zwang

üller

abstimmung

hintergründe

ticker

reaktionen

emotionalsten

nobillag

initiant

kessler

befürworter

projer

billag

bigler

hans-ulrich bigler

sgv

leuthard

libertären

absender

blum

strafanzeige

zwang

gewerbeverband

06 Jun 2018, 11:16 | Swiss Media Criticism

powered by webLyzard technology

TOPICS

Medications

Brand Reputation

Pharmaceutical Industry

<input checked="" type="checkbox"/> Johnson & Johnson	431
<input checked="" type="checkbox"/> Pfizer	346
<input checked="" type="checkbox"/> Novartis	340
<input checked="" type="checkbox"/> Roche	331
<input checked="" type="checkbox"/> GlaxoSmithKline	193
<input checked="" type="checkbox"/> Merck	187
<input checked="" type="checkbox"/> Sanofi	182
<input checked="" type="checkbox"/> Takeda	170
<input checked="" type="checkbox"/> AstraZeneca	100
<input checked="" type="checkbox"/> Gilead Sciences	39

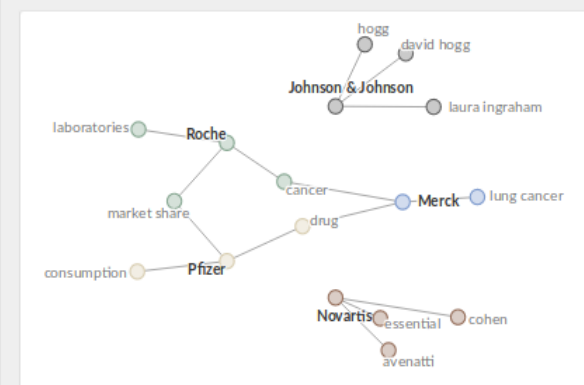
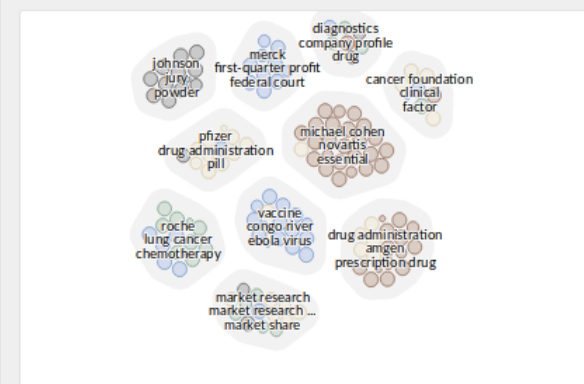
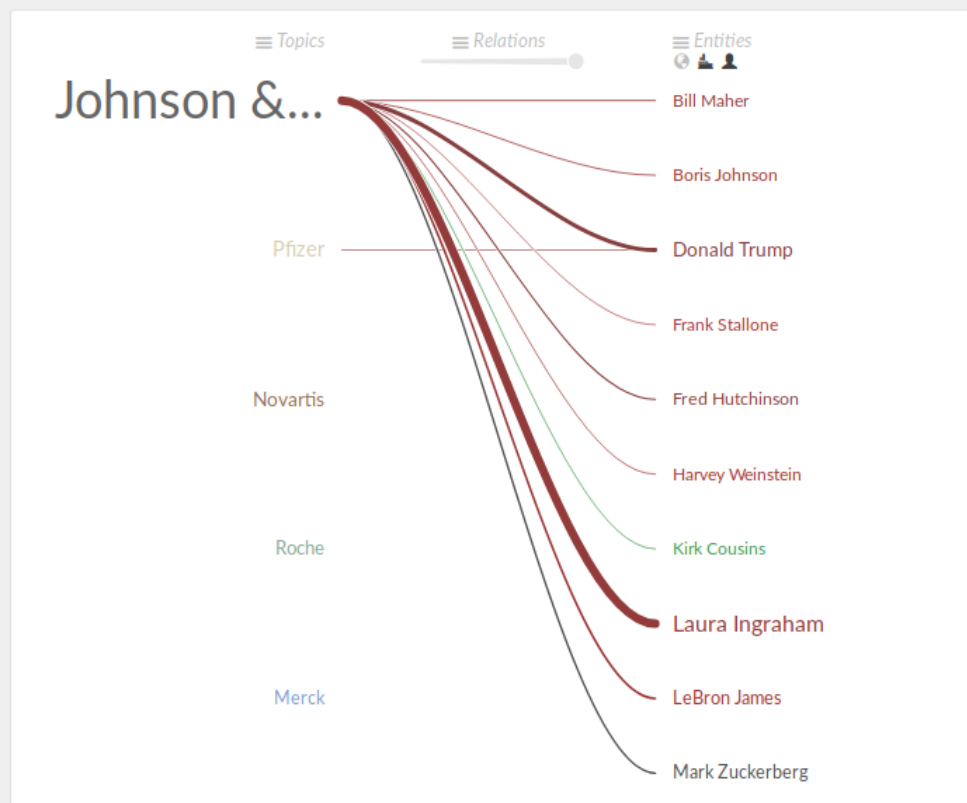
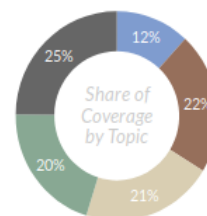
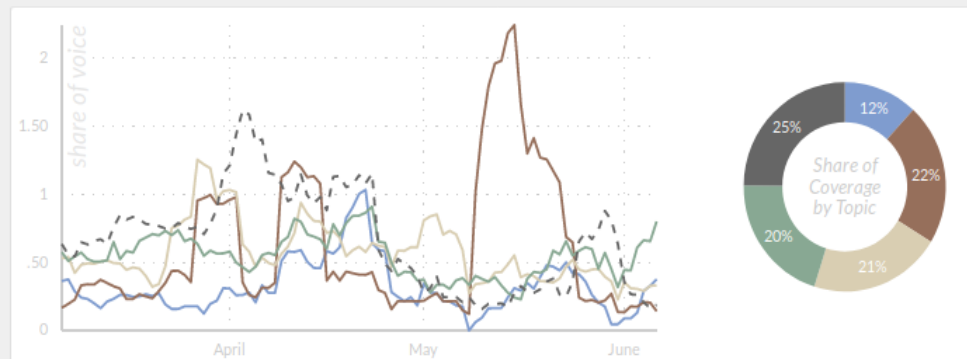
Mental Health Disorders

CURRENT SEARCH

<input checked="" type="checkbox"/> Johnson & Johnson	431
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ASSOCIATIONS

<input type="checkbox"/> hogg	1225
<input type="checkbox"/> david hogg	880
<input type="checkbox"/> laura ingraham	473
<input type="checkbox"/> fox news	4570
<input type="checkbox"/> market share	5865
<input type="checkbox"/> cancer	8779
<input type="checkbox"/> consumption	6885
<input type="checkbox"/> premium report	415
<input type="checkbox"/> jury	9052
<input type="checkbox"/> parkland	6774
<input type="checkbox"/> powder	2109
<input type="checkbox"/> global	31084
<input type="checkbox"/> apology	3615
<input type="checkbox"/> drug	15930
<input type="checkbox"/> boycott	1735





Use Case 1

Digital Asset Management

Process optimization

Cross-modal information extraction for improved image meta data



Textual description

In this image taken from video a camera drone crashes into the snow narrowly missing Austria's Marcel Hirscher during an alpine ski, men's World Cup slalom, in Madonna Di Campiglio, Italy, Tuesday, Dec. 22, 2015.

Context information

Events, Persons, Organizations, Locations



Keywords, Sentiment

camera drone, crash, Marcel Hirscher, alpine ski, World Cup, slalom, Madonna Di Campiglio, Italy

Classification (IPTC codes)

alpine skiing, slalom, accident (general)





Use Case 2

Company Valuation

Product innovations

Knowledge discovery, extraction and fusion for improved decision making

DISCOVER



World Health Organization
International Clinical Trials Registry Platform Search Portal

Home Advanced Search List By Search Tips UTN ICTRP website Contact us

Back to Search Export to CSV Export results to XML

9708 records for 7368 trials found for: lung cancer ([What is this?](#)) Show 10 records per page

Recruitment status	Prospective Registration	Main ID	Public Title	Date of Registration
Not recruiting	Yes	NCT03166254	Combination of a Personalized Therapeutic Anti-tumor Vaccine With Pembrolizumab in Non-Small Cell Lung Cancer	23/05/2017
Recruiting	Yes	NCT03164694	APatinib Plus Chemotherapy vErsus Chemotherapy As First-line Treatment for Advanced NSCLC	22/05/2017
Recruiting	Yes	ISRCTN70042662	Evaluation of an online intervention to encourage early help-seeking for lung cancer symptoms	22/05/2017
Not recruiting	Yes	NCT03164772	Phase 1/2 Study of Combination Immunotherapy and mRNA Vaccine in Subjects With NSCLC	22/05/2017

Deep Web knowledge discovery & extraction

Study ID: NCT03164772
Title: mRNA Vaccine in ...
Condition: Metastatic Lung Cancer
Phase: Phase 1; 2



Board of Directors

ARUN K ASAITHAMBI, PH.D.
 Co-Founder, CEO

Dr. Asaithambi is the founding CEO of Dallas based Lantern Pharma Inc, Genomics and AI based biotech company developing...[more](#)

PETER NARA, D.V.M., PH.D.
 Chief Strategy Officer

President and Chairman of the Board of Biological Mimetics, has 18 years of successful co-founding and growing discovery...[more](#)

Named entity recognition & linking

Company: Lantern Pharam
Address: 211 N Ervay St, Dallas, TX 75201, USA
Phone: +1 515-231-2065
CEO: Arunk K. Asaithambi, PH.D.
CSO: Peter Narad, D.V.M., PH.D.



VENTURE VALUATION



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Use Case 3 Recruiting

Product Innovations

Web analytics, data enrichment and predictive analysis for improved recruitment and career management processes



We are an independent engineering, planning and consulting company

We develop pioneering solutions for extensively used spaces. Specialists from over 30 disciplines work together to achieve this goal. Our joined-up thinking and our competency to see the big picture characterize our work.



Eric Jaquier
Mitglied der Geschäftsleitung, Leiter
Niederlassung Murten
Murten
+41 26 672 99 77



Sylvia Jaus
Projektleiterin
Esslingen
+41 44 387 12 69
[E-Mail](#)



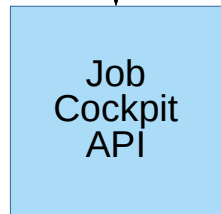
Peter Jost
Leiter Sicherheit
Zürich
+41 44 387 13 91
[E-Mail](#)

Knowledge
Extraction

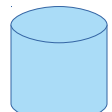
Privacy aware knowledge extraction

Semantic search

Predictive
analytics



Anonymized job
profiles + context



MATCHIX
domain ontology

Construction engineer
15 km from Zurich
Specialization: ...

Branche: Engineering
Education: ETH Zurich
Certificates:
Project manager: 2a
Lead: 5a
...

MATCHIX

Conclusions

- Natural language processing, machine learning and visual analytics are “enabling technologies”
- Application poses (i) technological and (ii) economic challenges which require close collaboration between data scientists and domain experts
- Requires a clear understanding of the available data as well as the potential and limitations of the methods applied to these data
 - data sources that contain relevant data
(would a human with unlimited time resources be able to extract the required information)
 - identify suitable methods

Thank you for your attention!



Platform Description
www.weblyzard.com



Web Intelligence
http://htwchur.ch/?id=web_intelligence



Contact
Albert.Weichselbraun@htwchur.ch

Contact

University of Applied Sciences Chur (HTW)
Pulvermühlestrasse 57, 7000 Chur