



1st Open Annual Workshop on Future ICT

Deep Semantic NLU Algorithms for Information Superiority

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*Expert.ai makes AI simple,
makes AI available...
makes everyone an expert!*

Agenda



About Expert.ai (Live Demo)

Behavioural Algorithms (Live Demo)

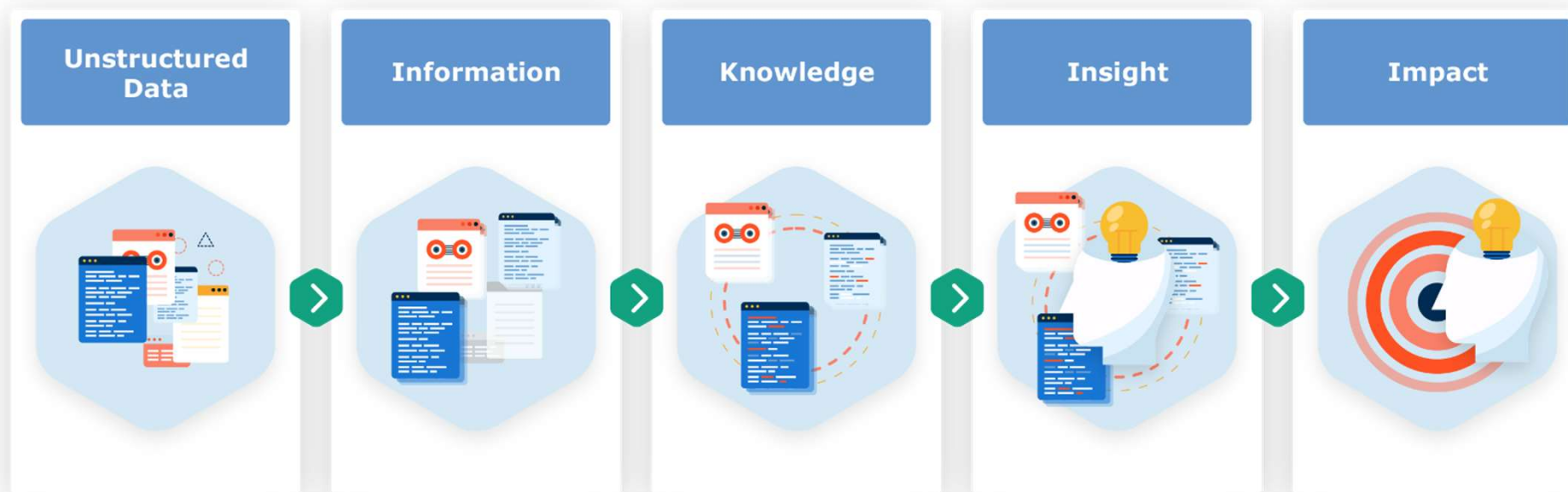
Synergies of semantic features ...for pattern and relation detection

Integration into an Intelligence Platform (Live Demo)

Conclusions

Don't Get Left Behind

60% of global enterprises are sitting on **100+** terabytes of unstructured data* .
In other words, **businesses are producing the text equivalent of a new Library of Congress every day.**



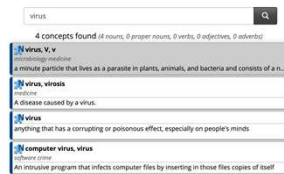
Today's challenges are no longer simply a question of computing speed and power: technologies must also be **intelligent**. How you can turn this into **insight**?

*Source: Forrester

What Expert.ai does?

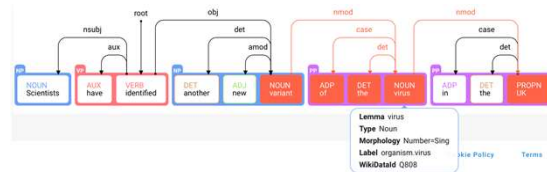
The ability to understand language and transform it into insights

Knowledge Graph



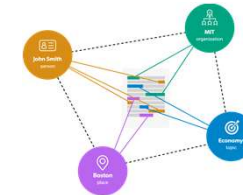
Expert.ai's knowledge graph is a representation of the real world where concepts are defined and connected to one other by semantic relationships.

Natural Language Understanding



Expert.ai distinguishes the correct **meaning of words** and expressions in context and automatically associates the attributes of more general terms that are conceptually linked to these words.

Reasoning Process



As the accurate comprehension of textual content always requires domain-specific knowledge. **Hybrid** Expert.ai technology can **mimic human** reasoning while analysing either on-line or off-line contes

YOUR EXPERTISE AT SCALE

Embedded Knowledge

Disambiguation

Actionable Insight

The platform for language understanding



Best of Breed

- Unique Hybrid NL
- Multiple languages
- Intuitive tools for business, data scientists and IT users
- Learns with training & human experts
- **Low Total Cost of Ownership**



Smart from the start

- Knowledge Graph (400K concepts, 6.5M+ relations)
- Vertical Solution Accelerators
- **Faster time to value**



Practical

- Cloud or private cloud
- Explainable & Trustworthy AI
- Green AI with lower compute cost
- **Results not experimentation**



Platform approach

- Supports full range of use cases
- No stovepipe model technical debt
- **Enterprise ROI**
- **Becomes a strategic advantage**

About Us



€ 35m
Revenues

~290
employees

Public Company (EXSY)

- Largest global company specialized in Natural Language Understanding technology
- Direct branches in US, CAN, UK, FR, DE, ES & IT

Dedicated to Customer Success

- Award winning Patented technology
- 30 years of R&D investments to create expert.ai technology
- Local technical & client teams committed to our customers' business & technology needs

Award Winning



2020 Best Overall
NLP Company



Magic Quadrant
for Insight Engines



AI-based Text
Analytics Platforms

Industry Recognition



FORRESTER®

AI-Based Text Analytics

People & Document-Focused Platforms

"...expert.ai's knowledge graph beats purely ML-based text analytics apps ...achieving faster time-to-value, more predictable results, and lower overall cost of ownership."

2020 Forrester Wave



Machine Learning and Artificial Intelligence Partner of the Year



Best Overall Natural Language Processing Company



KMWorld 100 Companies that matter in KM

Expert.ai Technology at the end



Expert.ai uses **patented AI algorithms** to mimic the human ability to read and understand any textual content

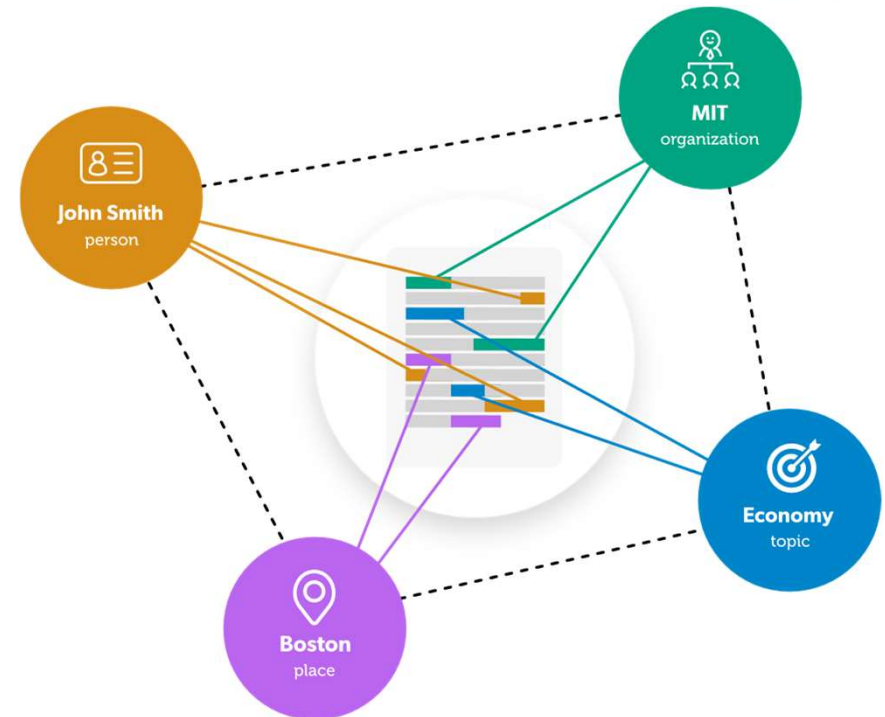
Expert.ai is based on a **pre-trained Knowledge Graph** with millions of concepts, entities, synonyms in **15 different languages**

Hybrid AI: unlike traditional ML, it **does not require thousands or millions of examples** to be "trained from scratch"

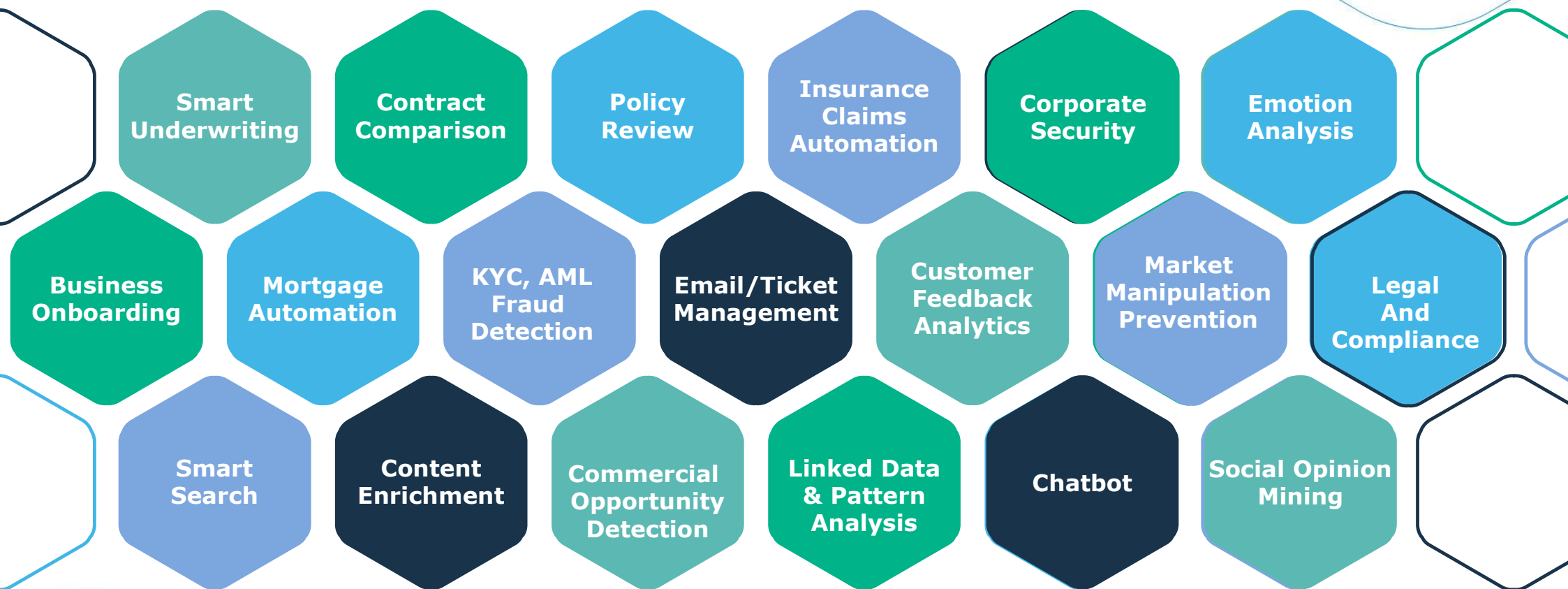
Uses **advanced semantic rules** to classify and extract information with one of the higher accuracy levels on the market*

It's **not a black-box**: its Explainable AI concepts can always be described, documented and audited

* Fonte: Forrester



What Expert.ai can do for you ?



A typical project released together



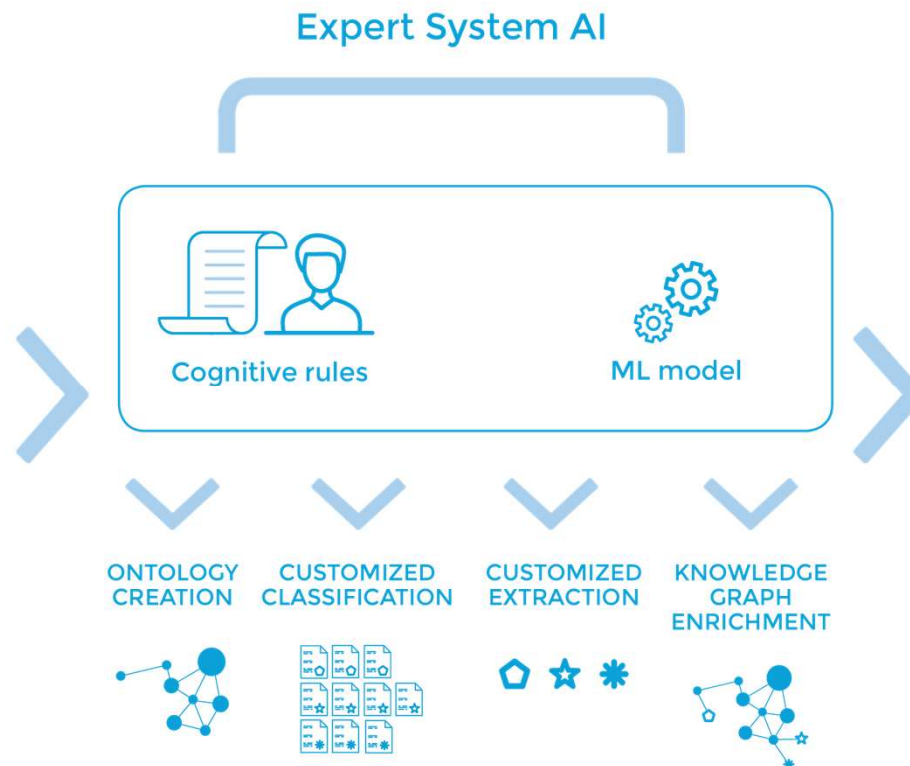
STEP 1

Collect customer requirements and **document samples**



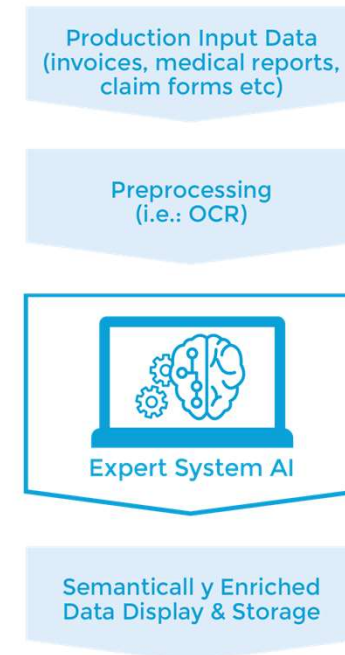
STEP 2

Develop linguistic project for content **categorization** and **entity extraction**



STEP 3

Release Linguistic Project as an API to be integrated in existing E2E production workflows/platforms



Customers



Finance & Insurance



Media & Publishing



Government & Defense



Others



Partners



Expert.ai Live Demo



Free access demo into 5 languages at our web site:

<https://try.expert.ai/>

Please let's try & enjoy it !

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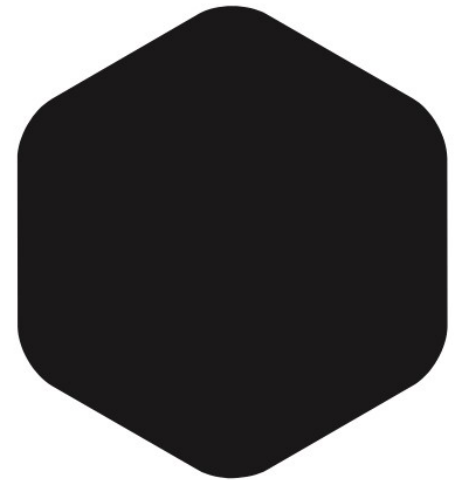
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Emotion & Stylometric analysis



expert.ai

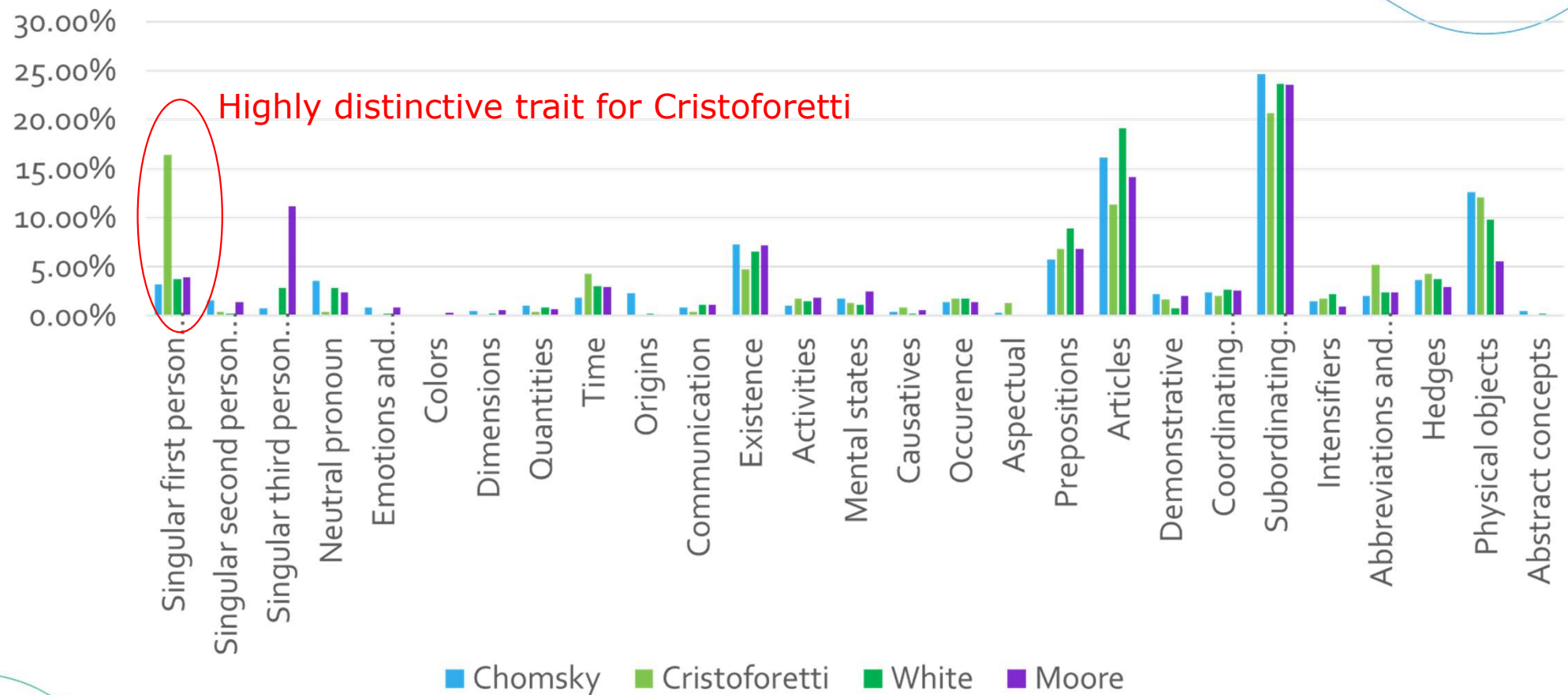


Fingerprints



Handwriting recognition

Like the DNA sequences structure



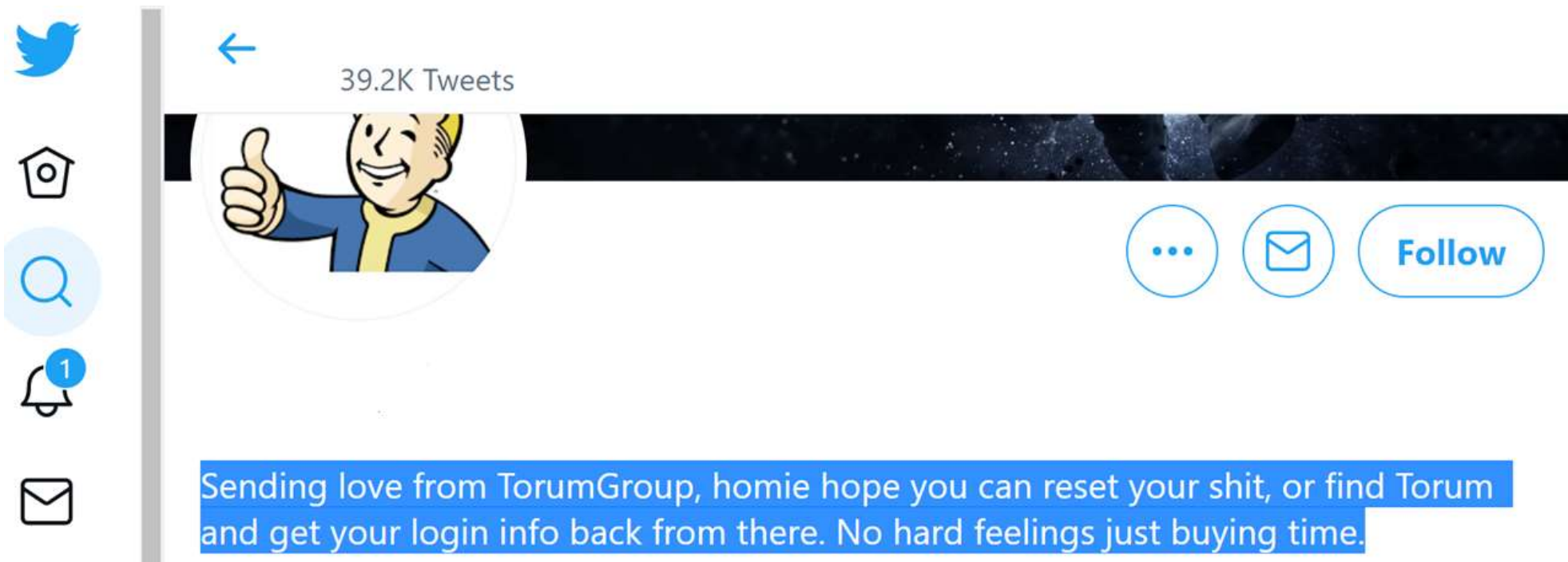
Semantics as added value

Governments and private organizations have developed classification schemes that are used for various purposes including regulation, description and categorization of financial activities.

- 10 Nouns
 - 10 commons nouns
- 2 Verbs
 - 1 Active verb
 - 1 Simple Present verb
 - 1 Passive verb
 - 1 Present Perfect verb
- 3 Prepositions
- 2 Punctuation marks
- 2 Conjunctions
- 2 Adjectives
- 1 Pronoun
 - 1 Relative pronoun

Only 22 words with many stylometric features

Authorship identification – Surface Web



Authorship identification - Dark Web



On dark web people talks more “easily” than on surface web

The prepaid debit card is not your bank card its just that a prepaid debt card, your bank card will come after the fact and that is where your fun begins. This isnt a quick cash out scheme, but the return could be in the 10's of thousands. The guy that was coaching me had 2 or 3 of these bank account and he would even sell them for a couple grand. But he would apply for loans and credit shit and use the loans from different accounts to pay off the loans of the other accounts, then once he had enough credit he would ball big and burn the account...I mean I cant confirm all the way through the process I got it all the way up to the setting up my bank account. and like I had mentioned I burned that with tor. I never got around to trying it again. I guess I might need to. Oh this is one of my easter eggs Ill never mention this process again...keep this bitch hidden right here nice and nuzzled into...still one of the stupidest requests I think I have ever seen. But we'll blame it on your wording or lack there of, we are going to calls these things 4ngry3ggs, Ill leave these around here and there to try to make them worth everyone's while. Ill post links to hard to find tools or cracked tools like the SS7 tool ;P. Maybe if I get to the point of writing exploits leave those placed around, just look for the tag, we are going to call this one 4ngry3gg#1. Hope you get rich with all that free money. Just promise me one thing, with all that cash you are going to be rolling in donate a fair piece to an organization on this list.
https://en.wikipedia.org/wiki/List_of_organizations_opposing_human_trafficking

Emotions & Stylometry live demo

Free access demo into English language at our web site:

<https://www.intelligenceapi.com/>

Please let's try & enjoy it !

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**Synergies of
semantic features**

**.... for pattern and
relation detection**



Synergies of semantic features ...

1. **source reliability and metadata (date, title, likes, ..).** How many time news is bounced/commented, so understanding its virality
2. **entities extraction:** people, places, products, financial services, amount per currency,
3. **categorization based on multilevel and multilanguage taxonomy**
 - organising news into specific targeted categories
 - many comments linked to a category means potential presence of social bot
 - same fact from opposite journals means there is no speculation

Synergies of semantic features ...

4. Reasoning by relations, patterns and temporal references extractions:

- combining facts into events and correlate them by relations (Network reconstruction)
- recognizing illegal markets/products, understanding patterns (known or new patterns), discovering payment method and new modi operandi detection
- spread of news over time, evolution can be a natural vs manually conveyed

5. Cluster of similar news with different % of semantic rank

- discover originator, copiers use synonyms
- understanding comments similarity and matching with original message
- inferring correlated concepts by ontology navigation (semantic reasoning)
- revealing a concept meaning inside content (unknown knowledge generation)

Synergies of semantic features ...

6. Emotion analysis (not only sentiment) so anxiety, fear, stress, love, ... :

- Different emotions on news vs comments (moving away from the content)
- an emotion is interesting if it moves far from the average (detecting out-of-usual)
- strong mood/emphasis as it aims to influence the reader

7. Stylometric analysis, so specific verbal groups, slangs, jargons, human factors, ethnicity, :

- mapping different Virtual IDs to Physical IDs (Dark Web to Surface and Viceversa)
- understanding social bot vs humans
- understanding pro/counter messages with same morphology
- writers use different words if they trust on the news or not
- Disinformation/Misinformation may be done by less skilled people (vocabulary richness)
- Polarization/Radicalization discovering by gender, age and mother tongue analysis (Cognitive Warfare)

Synergies of semantic features ...



- Once a suggestion/deduction is validated by an end-user, it becomes part of the validated Knowledge Graph (Ontology), so the same process can start again with a new and wider know-how!
- More know-how means more efficient prediction (**EX-ANTE analysis**)
- Improvement of searching on historical use cases (f.e cyber reports) in order to mitigate future similar events (**EX-POST analysis**)

The target is to extract and to infer semantic data from unstructured contents in order to gain ***Information Superiority*** useful for ***Augmented DSS, Simulation & Prediction*** environment.

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Integration into an Intelligence Platform



Why an Intelligence platform?

1. Discover and aggregate all relevant information in real-time by monitoring (f.e) social media, cyber reports, technical documents, historical use cases, ... and more
2. Support strategic and tactical decision making through case monitoring and analysis of financial activities, social and business impacts and citizen emotions:
 - a) Decision-makers must be able to search and explore all of the data available
 - b) Discovering information and relationships that are initially unknown
 - c) Using customer ontologies, taxonomies (f.e FIBO, IPTC,) and specific extractions
 - d) Facilitate scanning for emerging threats and issues (detecting weak signals)
3. To finally mitigate risks and to address the response to crises and threats into different domains

Enjoy the Live demo !

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- **Expert.ai COGITO:**
 - Hybrid NLU technology (Deep Semantics and Machine/Deep learning)
 - Explainable AI by advanced deep semantic rules (no black box)
 - Frugal learning approach because based on domain-oriented Ontologies
- **How using semantics in synergies for:**
 - Criminal Network Reconstruction
 - Emotion and Computational Stylometry
 - Unknown concepts discovering
- **Finally merging everything within an high TRL Intelligence platform for:**
 - Making better decisions
 - Extending existing tools/systems
 - Realizing the value of language



Thank You

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