### The European Commission's science and knowledge service

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#### Joint Research Centre

Directorate I - Competences JRC I.3 Text and Data Mining Unit

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## **Text Mining and Analysis**

#### Summer School in Public Audit and Accountability Pisa 25/07/2018 Jakub Piskorski





- What do we do?
- Europe Media Monitor (EMM) family of applications
- Event Extraction
- Importance of multilingual processing
- OSINT Suite (Open Source Intelligence)
- References & Events



### **Text and Data Mining Unit**





#### **Text and Data Mining**



Statistics and Information Technologies for Anti-Fraud







**BigData & EOSS** Earth Observation & Social Sensing Big Data Pilot Project



## I3: Synergy

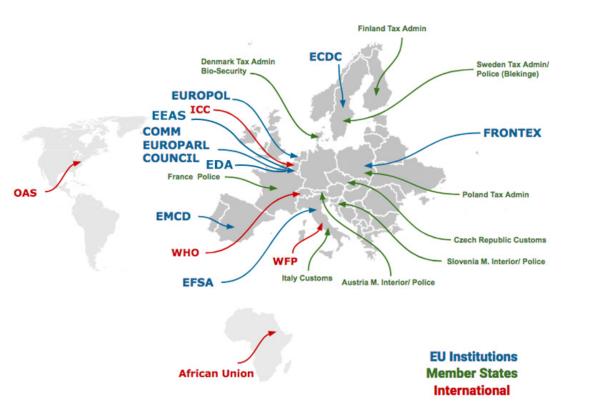


Interest from academia for collaboration and applied research in dynamic operational environment

> European Commission

Interest and feedback from real world customers and policy makers for operational product, stimulating research and innovation

#### CLIENTS



EU Institutions, EU Agencies, UN Agencies, African Union, Organization of American States, Member States Tax Agencies and Customs



### **I3: EMM - Philosophy**

A complex system that works is invariably found to have evolved from a simple system that worked. A complex system designed from scratch never works and cannot be patched up to make it work. You have to start over with a working simple system. – John Gall (1975)



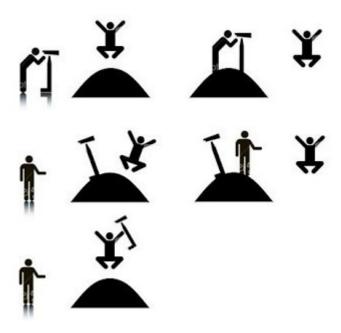
### Is Natural Language Processing Easy?

"I saw the man on the hill with a telescope"



### Is Natural Language Processing Easy?

#### "I saw the man on the hill with a telescope"



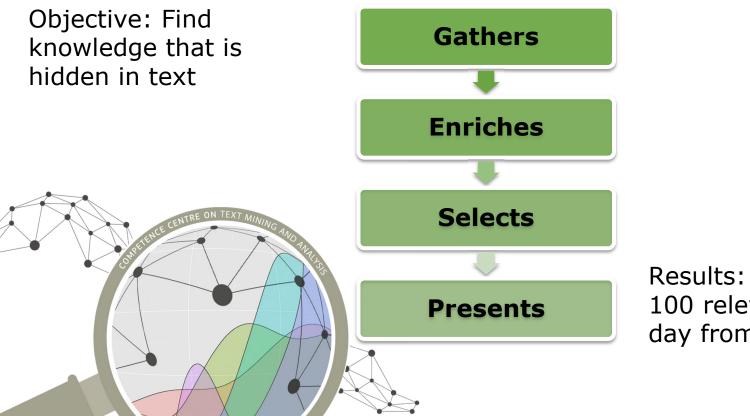


# Media Monitoring for Open Source information analysis

- Started in 2002 to provide Internet Media Monitoring to complement/replace traditional cut-and paste
- Information for decision makers, spokes persons: mainly 'political events'
- Initially main customer DG COMM. Evolved into monitoring for other kinds of events: disasters and crisis, security, health threats, countries, etc.



### What is EMM



Results: Find perhaps 100 relevant articles a day from 300 000



### What is EMM

A tool to monitor, analyse and aggregate online and other electronically available sources

#### Wide Coverage

- Local, Regional, National and International
- Multi-Lingual

#### **Rapid Updates**

 High Frequency (5min)

#### **Sources Covered**

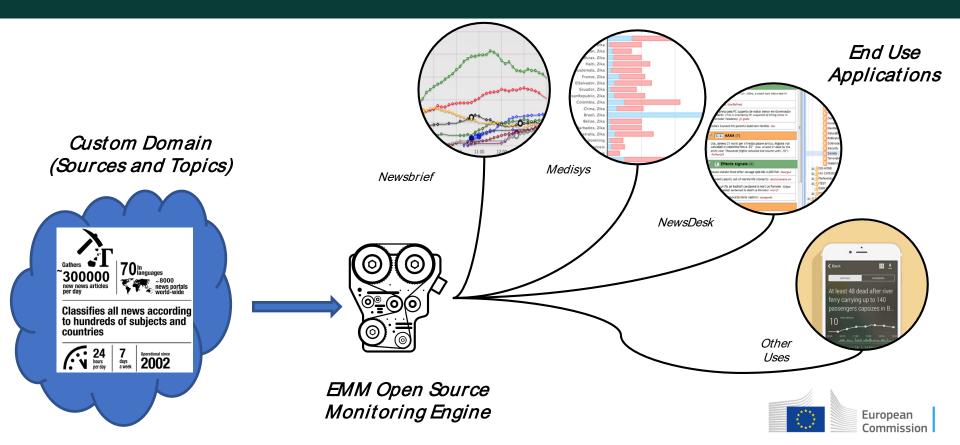
- Online media
- News wires
- Blogs
- BBC Monitoring
- Oxford Analytica
- Etc...



#### **Full Text Analysis**



#### EMM Architecture



### What EMM can do for you

**Reduce amount of data to be analysed** Filter out relevant information based on predefined categories

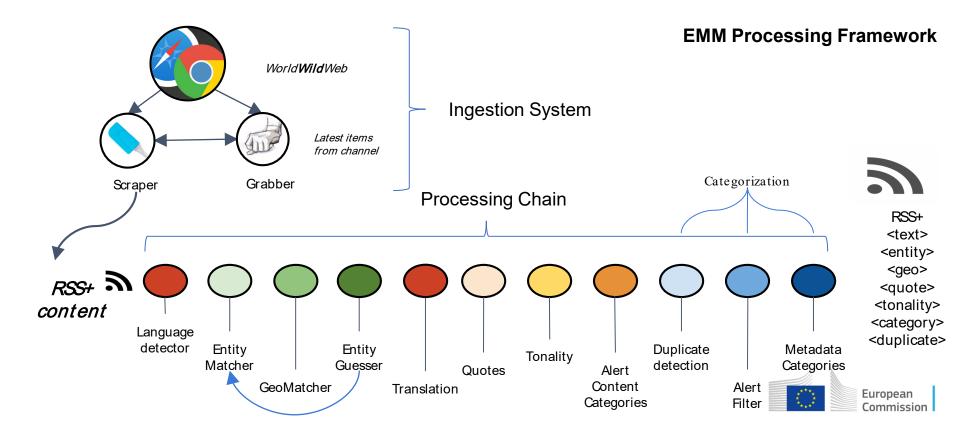
**Provide additional information** Other categories, places, people, quotes

**Provide automatic alerting functionality** Simple email Breaking news Breaking news per category

Replaces manual searching in selected sources



#### EMM Architecture



#### Language Detection



Language: English US president Donald Trump intention to cut the US corporate tax rate to 15 per cent may not be achievable with the border adjustment tax, which might have funded the reduction, now off the table. Irish tax experts remain convinced that US tax reform, whatever shape it takes, will not adversely damage Ireland's economic prospects, suggesting incentives for US multinationals to base operations here will continue. "All in all, I wouldn't be unduly worried at this juncture," Alan McQuaid said.



We cover ~ 70 languages



"All in all, I wouldn't be unduly worried at this juncture"



#### **Entity Detection**



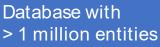
US president Donald Trump intention to cut the US corporate tax rate to 15 per cent may not be achievable with the border adjustment tax, which might have funded the reduction, now off the table. Irish tax experts remain convinced that US tax reform, whatever shape it takes, will not adversely damage Ireland's economic prospects, suggesting incentives for US multinationals to base operations here will continue. "All in all, I wouldn't be unduly worried at this juncture," Alan McQuaid said.





Our entity DB is built on an Entity Guessing system.

- Different names with same title
- New title with different name





### **Named Entity Detection**

An entity is only associated with his name

- Various spellings
- Acronyms
- Short/long forms and aliases

The entity system does **not** do any disambiguation

#### Joseph "Joe" Borg

- Maltese politician, former Commissioner for Fisheries and Maritime Affairs
- Maltese soccer player
- American financial regulator who has served as the Securities Commissioner of Alabama since 1994



### **Update Known Entities**

 Guessed entities are used to enrich and keep up-to-date the known entity resource

 600 unknown names per day are compared daily with ~1,500,000 known name variants

• 120 are automatically merged with known entities

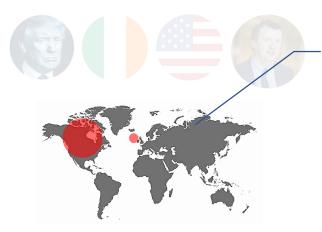


#### **Geo Detection**



US president Donald Trump intention to cut the US corporate tax rate to 15 per cent may not be achievable with the border adjustment tax, which might have funded the reduction, now off the table. Irish tax experts remain convinced that US tax reform, whatever shape it takes, will not adversely damage Ireland's economic prospects, suggesting incentives for US multinationals to base operations here will continue. "All in all, I wouldn't be unduly worried at this juncture," Alan McQuaid said.





#### Database with 1.3 million entries



### **Geo Dissambiguation**

#### Matching

Bill <u>Clinton</u> went to <u>Venice</u> during his visit in <u>Italy</u>

Entity

The most specific wins!

Nothing USA related

#### Disambiguation

Clinton:Pennsylvannia:USA cls: -3

Venice:Veneto:Italy cls:-3

Venice:Venice:Veneto:Italy cls:2

Venice: Madison: Illinois: USA cls: 5

Italy cls: -1

• Result

georss: Venice: Venice: Veneto: Italy fullgeo: Italy



### **Entity-Geo Disambiguation**

#### Montenegro

- Common place name (country, cities, regions)
- Common person surname
- Spanish famous fiction character
- Italian bitter liquor

#### **Other examples:**

- Hannah Montana
- Paris Hilton
- Asia Argento
- Michael Jordan



### **Machine Translation**





- Statistical Machine Translation (planning for NMT)
- Only from original language to English.
- 14 EU languages
  - Czech, Danish, Dutch, Finnish, French, German, Greek, Italian, Latvian, Lithuanian, Polish, Portuguese, Spanish and Swedish
- + Russian, Farsi, Chinese\* and Arabic.



#### **Quote Detection**



US president Donald Trump intention to cut the US corporate tax rate to 15 per cent may not be achievable with the border adjustment tax, which might have funded the reduction, now off the table. Irish tax experts remain convinced that US tax reform, whatever shape it takes, will not adversely damage Ireland's economic prospects, suggesting incentives for US multinationals to base operations here will continue. "All in all, I wouldn't be unduly worried at this juncture," Alan McQuaid said.



Quotes are both "From & "About" in 19 Languages:

ar,bg,da,de,em,es,et,fr,it,nl no,pl,pt,ro,ru,sl,sv,sw,tr



"All in all, I wouldn't be unduly worried at this juncture" Alan McQuaid



#### Categorisation



US president Donald Trump intention to cut the US corporate tax rate to 15 per cent may not be achievable with the border adjustment tax, which might have funded the reduction, now off the table. Irish tax experts remain convinced that US tax reform, whatever shape it takes, will not adversely damage Ireland's economic prospects, suggesting incentives for US multinationals to base operations here will continue. "All in all, I wouldn't be unduly worried at this juncture," Alan McQuaid said.



Categorization: Taxation Economy EU-US trade



3.000 categories/topics based on more than 60.000 keywords



### **Powerful Categorisation Engine**

- Based on user defined keywords/patterns
- Boolean combinations, proximity, wildcards
- Support for Arabic and similar (automatic noun-prefix processing)
- *Support* for **Chinese** and similar (no whitespace).
- Categories can be overlapping, **no ontology**



#### Complex criteria...

Category Editor				v1.4.4
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ForgeryMoney	May Article Age:	אלכוהול	drogmaffi%	10
GeneralCrime	Max Article Age:	פטריות+הזיה	kábítószer+maffiá%	10
HumanTraffic	No Value	פסיכדלי 🗆 🚍	kábítószer-maffiá%	10
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		סמים+קשים 🗔 🚍	traffico+internazionale+di+droga	10
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		סמים+בספורט		
		סמים+משכרים	narcotrafficant Word-Weight L	10

#### No Panic!

- we deliver trainings (1-2 days)
- We provide support too.

You should provide:

- domain knowledge
- some translations



### Tonality



US president Donald Trump intention to cut the US corporate tax rate to 15 per cent may not be achievable with the border adjustment tax, which might have funded the reduction, now off the table. Irish tax experts remain convinced that US tax reform, whatever shape it takes, will not adversely damage Ireland's economic prospects, suggesting incentives for US multinationals to base operations here will continue. "All in all, I wouldn't be unduly worried at this juncture," Alan McQuaid said.





"All in all, I wouldn't be unduly worried at this iuncture"



### Structured data: logical view



Language: English US president Donald Trump intention to cut the US corporate tax rate to 15 per cent may not be achievable with the border adjustment tax, which might have funded the reduction, now off the table. Irish tax experts remain convinced that US tax reform, whatever shape it takes, will not adversely damage Ireland's economic prospects, suggesting incentives for US multinationals to base operations here will continue. "All in all, I wouldn't be unduly worried at this juncture," Alan McQuaid said.



Categorization: Taxation Economy EU-US trade



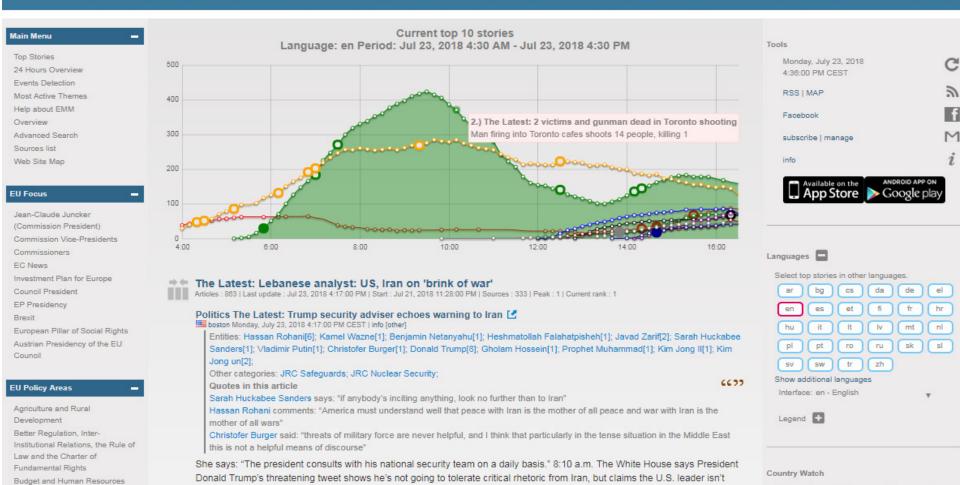




ST. 2002

#### Top Stories

#### UPDATED EVERY 10 MINUTES, 24 HOURS PER DAY.



# [\*;\*]MEDISYS

Top Stories	Latest News About - Den	que Fever					
Event Extraction		9			Tools		
Recent Disease Incidents	Daily number of Tweets	Top Twitter Users	Top HashTags	Top URLs	Tuesday, July 2 11:40:00 PM C		
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	Trigger words: [DengueFever] Aedes				FrenchPolynesia		

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Alert level:

2 4

0 Previous 14 days average

high medium low

6 8 10

NEW DELHI: is turning out to be the fastest mosquito-borne disease this As per municipal data released on Monday, 75 people have been affected by malaria as on July 21 this year. It is higher than the number of people affected by dengue (43) and chikungunya (34), the two other mosquito-borne diseases, in the said

Other categories: WHO; Malaria; Pharmaceuticals;

#### **Personal News Dashboard**

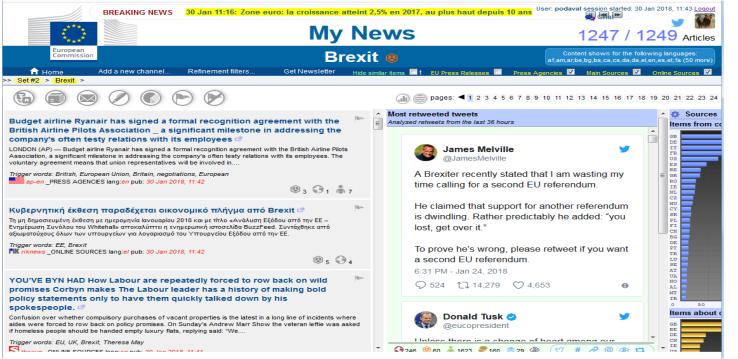


#### **MyNews: Hashtags**

	BREAKING NEWS	30 Jan 07:22: "Le vo	let agricole de l'acc	ord avec	le Mercosur pas acceptable en l'é	etat" (Charles M	d: 30 Jan 2018, 11:43 <u>Loqout</u>
$\sim$			Му	Ne	WS		1249 Articles
European Commission			Br	exit			e following languages: a,de,el,en,es,et,fa (50 more)
Home	Add a new channel	Refinement filters	Get Newsletter	Hide simila	ar items 🔲 t 🛛 EU Press Releases 🔲 🛛 P	ress Agencies 🔽 🛛 Main Sources	Online Sources 🗹
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British Airline Pilots company's often tes ONDON (AP) — Budget air	Association _ a s sty relations with line Ryanair has signed a lestone in addressing the that union representative pean Union, Britain, neg	formal recognition agreement w company's often testy relations as will be involved in otiations, European	n addressing the		Twitter hashtags Analysed tweets from the last 36 hours #Brexi #StopB #FBPE	rexit	Sources Rems from cc GB E E E E E E E E E E E E E
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European Commission

#### **MyNews: Most retweeted tweets**





#### **MyNews: Most Active Users**

BREAKING NEWS IN MAP 17:16	BREAKING NEWS 11 Mar 17:16: Taxes sur l'acler : Trump pose ses exigences, l'UE est surprise								
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rules should apply to companies or parties from a third country, focusing on the United Trigger words: EU, Brexit, negotiations <i>km-DNS-SE_MAIN SOURCES lang:en pub: 12 Mar 2018, 07:58</i>	Kingdom. ■ 1 ⑧ 7 ♀ ▲ 2		Vince Cable @vincecable MP for Twickenham. Leader of Liberal Democrats. Socialist Voice	1	Followers: 137302 Following: 3900		IT DE PL SK E LU ES		
Swedish Prime Minister Löfven meets with Luxembourg Prime Bettel Control News agency TT reports that a potential EU-US trade war was the focus of Swedish I			GSocialistVoice Labour Party & Jeremy Corbyn Supporter   Social Justice & Disability Rights Campaigner   LGBTQIA+   Brexiteer   Democratic Socialist   #FreePalestine	<b>e</b>	Followers: 52480 Following: 49319		SI AT BG LV CZ		
meeting with Luxembourg Prime Minister Bettel. The two leaders also discussed the Mu Framework (MFF). Mr Lörven stated that a higher EU budget is not acceptable for Swe funds would have to go to the EU. If the EU wants to focus more on issues such as the will have to reduce structural and agricultural funds, said Mr Löfven. Moreover, Mr Löf Brexit, and Mr Bettel stated that there are no winners of Forxit and that the negative ou	eden, as all of its reform e fight against terrorism, it fven and Mr Bettel discussed		A C Grayling #FBPE #ABTV #WATON #OFOC @acgrayling Philosopher, Author @NCHLondon		Followers: 47555 Following: 1821		FI RO CY GR 0 5	10	15 20
Trigger words: EU, Brexit Trigger words: EU,	2 14 3 2 1 3		Nick Reeves - #FBPE @nickreeves9876 Each day that passes makes clearer that implementing #Brexit will be immensely destructive to our country & its people.		Followers: 21135 Following: 8341		GB BE DE		E
Interview with Manuel Navarrete: "The return of mass jihadi feared has not occurred" of In an interview by ABC with Manuel Navarrete, Head of the European Anti-Terrorist Ce			Tim Walker ♀ @ThatTimWalker A point of view mandrake@theneweuropean.co.uk		Followers: 23353 Following: 898		US IE FR IT NL SE		
in Europe. He comments that, "In the EU we were expecting a strong return of potential iraq since 2016 and, therefore, we maintain a very intense monitoring because we thous territory under the control of the Islamic State would produce an availanche of returns countries do not inform us that this is happening." When asked about if the Brext will h states that it is necessary to "maintain the best possible levels of cooperation".	I terrorists from Syria and ought that the reduction of to Europe. However, the		<ul> <li></li></ul>	# 8	@ & t		CA CN PL FI AT GR		
Trigger words: EU, Europe, Brexit, European <i>km-DNS-ES</i> _MAIN SOURCES lang:en pub: 12 Mar 2018, 07:55		1	EURO and Economic and monetary union				LU HU JP DK		



#### **MyNews: Keywords cloud**





#### **EMM News Desk**

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		- (( Mon sout from avr. sup	Soution canadiem do 156 millions do dollars pour l'annélioration de la santé, de la sécurité et - (Canadian support of 156 million dollars for improving health, safety and) bacente, il sur 2015 (MB-) pre mail égain constrat, il sur 2015 (MB-) pre mail égain constrat, il sur 2015 (MB-) pre mail égain tornatissie dans le pays d'heirighte attine et aux canadies fut montant attine de bacent de bacent formatissie dans le pays d'heirighte attine et aux canadies, d'an montant attine de dans (Anorreal, IT support of several initiatives en mettre de santé, de securité geuernance de donars (Inserval, IT support of several initiatives in health, security, democratic severance and border manegement in the countries of latin america and the coribbean, a local annuel of 15 million advisor)						
		Saisie de 600 kilogrammes d'héroïne dans l'est de la Turquie - (Seised 600 kg of heroin in eastern turkey)							
		men Ista kiloj inte poli of E	ara 12 Apr 2015 00:38, Longu nbul, 11 Avr. 2015 (MAP)- L grammes d'héroline dans la rcepté un camion transpo ce turks have made the s	es services de police turcs province orientale d'Elazig, rtant la drogue qui provena seizure Saturday for a qua l press. Elements of the po	ont procédé à la saisie samedi d'une quantité d , rapporte la presse locale. Des éléments de la p it de la province (klargorias d'heroin in the east ulice have intercepted a truck carrying drug:	olice ont AP) - the ern province			
		int	ernational band nar	cotraffic required by	cotráfico requerido por EE.UU <i>(Stop</i> r usa)	to head of			
		Bog Sam extr nar bea Uni	uels Durán, alias "Samy", su adición fue pedida por Est cotics police arrested in	inarcóticos de Colombia det upuesto jefe de una organiz tados Unidos, informó hoy la the city of Barranquilla ( ganisation devoted to dru	tuvo en la ciudad de Barranquilla (norte) a Carlo ación internacional dedicada al narcotráfico y institución, (logosta, 11 Ayn, - the colombian north) to Carlos Enrique Samuels Durán, alla g trafficking and whose extradition was rec	cuya counter- is "Samy",			
			nlicata) Marrupcosi r	soruano fuo dotonido d	on droga on su oquinaio - (Morosso:	Persylan Y			
					4 Showing 30 of 296 Articles. 1 / 10	N N I I 📴 😒	3		



Presidential Wires 28 Apr 2015 - Edition 08:00

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Internal Document



#### **EMM Mobile**



European Commission

# **End-to-End solution**

#### **EMM** (Europe Media Monitor)

BBC	News Soort	Weather	Capital	Future /	Shop	TV	Radio	Nore	Search	-
NEWS EUROPE				4			/		1	Ş
	nenca mo-cast	US & Canada		Realizer St		mans	een enn	rtainmant	1010	
13 May 2014 Last updated at 01:29 GMT			198	hare 1	20	Тор	Storie			
Ukraine crisis: Ger diplomatic bid	many la	aunch	es fre	sh					8 planes searci gerian giris	h for
< latest Putin's next move?   Ho	w significant?	What next?	At the s	scene   Ir	•			benefits 'c		
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Sermany's foreign minister is due to arr ttempts to find a diplomatic solution to			Ukra	ine crisis						
Frank-Walter Steinmeier could also visit the				nterventio	n		t Pop			
Russian activists held referendums on self-			Q&A: I referen	Donetsk ndum		Shar			deo/Audio	
Earlier, a separatist leader called on Russia Ukrainian region of Donetsk.	a to "absorb" the	eastern		aine v Rus	ssia				'overhyped'	
Key, the US and EU say the referendums i	n Donetsk and Li	ahansk were	secon	ds		US tw	in bables	born hold	ing hands	
legal.			Identit	y issues		The s	hip of Jev	vish refuge	ies nobody wa	nted
doscow annexed Ukraine's southern autor darch following a controversial referendum						US N	wy releas	es 'stealth	e-reader	
			_			Spain	politiciar	shot dea:	d in public	
Russia has called for the results of Sunday vote to be "implemented".	\$					Germ	an push t	o ease Ukr	aine crisis	

- 8.000 News Sites
- 300.000 articles per day
- 70 Languages
- 3000 Categories/Topics

Breaking

News

- 60000 keywords
- Runs 24/7
- Visitors 25000/day

#### Domains:

- Border Security, Cybercrime & Fighting Crime
- Socio Political Event Monitoring
- Public Health Threats & Food Safety
- Conflict Early Warning
- Science and the Citizen





#### **Event Metadata Extraction**

#### "To detect automatically who/what did what to whom when, why, with what instruments and determine the consequences"

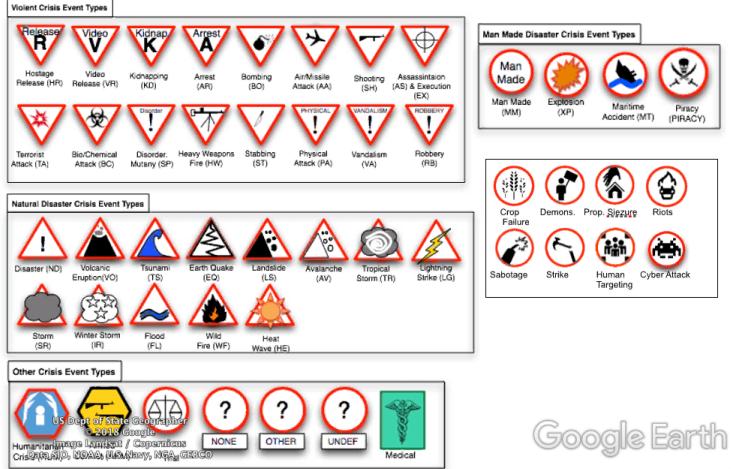
- Information Extraction Task as opposed to Information Retrieval
- Extracting information in order to fill slots of database-like structures
- Try to maintain EMM approach of being as much as possible language agnostic "syntactic lightweight"



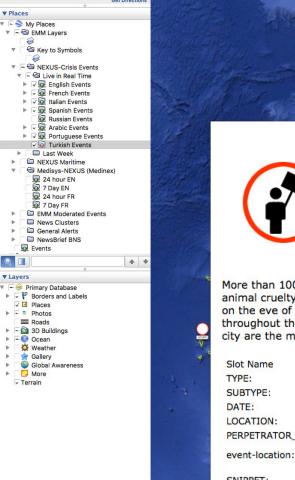
"Baghdad 12/01/2010 American soldiers involved in a firefight shot dead five Iraqi insurgents today during a routine patrol in Baghdad, 2 US soldiers were slightly injured with minor wounds. The firefight started after..."

Slot Name	Value
TYPE:	Shooting
PERPETRATOR:	American Soldiers
DEAD	Iraqi Insurgents
DEADCOUNT	5
INJURED	US Soldiers
INJUREDCOUNT	2
LOCATION :	Baghdad
TIME:	12.01.2010













More than 100 animal rights a animal cruelty with a mock bu on the eve of Pamplona's fam throughout the narrow, cobbl city are the main feature of the

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5

Slot Name SUBTYPE: LOCATION: PERPETRATOR DESCRIPTOR: Activists

SNIPPET:

articles:



#### Fire crews battle Aberdeen wildfire

Image caption The wildfire is covering an area measuring about 50m by 30m. Firefighters are dealing with a gorse fire at an Aberdeen golf course. Two fire engines and a wildfire unit were called to Links Road, close to the Royal Aberdeen course, at about 04:40 on Thursday. ... More

Slot Name	Value
TYPE:	Social
SUBTYPE:	Wildfire
DATE:	2018-07-05
LOCATION:	Aberdeen
event- location:	Aberdeen:Grampian:Scotland:UK[57.1408,-2.13011]
SNIPPET:	40am this morning at Royal Aberdeen Golf Club in Bridge of Don. A spokesman said: "Two units attended the
articles	



Pamplona:Navarra:Navarra, Comunidad

Foral De:Spain[42.8133,-1.65298] Activists protest against bullfight in

Spain, Mayawati meets ...

Public Demonstration

2018-07-05

Pampiona

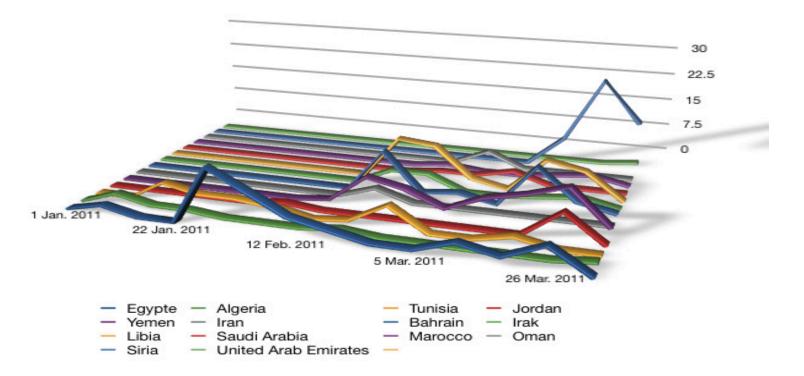




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# Basic Aggregation Analysis over Space and Time

**Civil Unrest and Protest Violent Events** 





Crisis Events	en,fr,it,es,pt,ru,ar,tr,bg[zh]
Border Security Events	fr,it,es,ar,(en,ru)*
Medical Events	en,fr,tr

\*1500 moderated events were imported into the Frontex Eurosur system, the event extraction and moderation systems were also used as inspiration define the policy for Eurosur (exchange of border security related events between Member States)

#### **Event Moderation**

Search																									
Countries: Types: Status:	Africa ×			Severit	ty:						Sources	:	v	Languages: Date from:		4 V		Dead:			Date to:	Injure	d:		
													Search eve	ents											
Events List																									
Title			Pub Date	Lang	Туре	Article	Severity	Dead	Injured	Country															Save changes
	Shabaab says has stormed military base i ttack On Taxi Drivers In S'Africa		23 Jul 18 23 Jul 18	en en	♥	8	Not Set Not Set	27	7	SO				n Attack On Taxi						Slots					
	ihadistes tués par l'armée malienne		23 Jul 18	fr	() ()	4	Not Set	12	0	ML		Snippet:	Gunmen ir	n South Africa a	imbush taxi d	irivers; 11 k	alled			Name		Value Mon. 23 Jul 20	10 10 40 56	CERT	
لديمة دون إصابات	السيطرة على حريق نشب داخل مغزن أخشاب بمصر ال	a	23 Jul 18	ar	V	6	Not Set	3	0	EG		Description:						a after gunmen opened fi police have said. Police		dead		11	16 10.42.56	GEOT	
يدي الجيش المالي	مصرع 11 ارهابيا على ا	<b>e</b>	23 Jul 18	ar	V	7	Not Set	11	0	ML	_		Jay Naicke	er said on Sunda	ay the drivers	s were on t	heir wa	ay home from the funeration of the function of the	l of a	injured perpetrator		others gunmen			
شقتهما في الجزائر 🗉	العثور على فلسطينيين من خان يونس متوفيين با		23 Jul 18	ar	Q	7	Not Set	1	0	DZ	-	Link	http://139.	.191.34.50:8181	/Nemo/nemo	/story/lead	ership	-8cbc769d4102d01337c	39fe1ef62422	targets		minibus			
أحكام صادرة ضده 🖽	مصدر: ترحيل منتج لمحكمة القاهرة لإجراء المعارضة على	<u>@</u>	23 Jul 18	ar		1	Not Set	0	0	EG	-		South Afric			Langua		English Not Set	* *	firstitem lastitem		2018-07-23T0			
+ Report: Islan	nic State group leader killed in Egypt's		23 Jul 18	en	Q	1	Not Set	1	0	LY	_	Dead:		10	\$		red: 4		\$						
ىتغالا بئورة يوليو» +	الثقافة» تفتح متحف جمال عبدالناصر. مجانا للجمهور. اد	<b>e</b>	23 Jul 18	ar	$\nabla$	1	Not Set	0	0	EG		Type:	Shooting						~						
± La photo du	jour		23 Jul 18	fr	$\forall$	1	Not Set	0	0	MA		Sources										Мар	1		a Pouroux
± Condutores	são julgados hoje em Luanda	<b>e</b>	23 Jul 18	pt	$\forall$	1	Not Set	0	0	AO		Title						Pub Date	Lan						11th
* 8 worshippe	rs dead in Konduga attack		23 Jul 18	en		1	Not Set	0	0	NG				Africa ambush ta shot dead after a			& &	23 Jul 18 09:01 +0200 23 Jul 18 07:38 +0200				burg	X V	X	
BREAKING:	8 worshippers dead in Konduga attack	<u>@</u>	23 Jul 18	en	$\forall$	1	Not Set	8	3	NG	_			On Taxi Drivers I	÷	ierarin		23 Jul 18 07:21 +0200				X	Krugersdorp	Randburg	Tembisa
+ Cameroun: I	ambassadeur du Sénégal a tiré sa rév		23 Jul 18	fr		1	Not Set	1	0	СМ		H South	frica shootir	ng: Eleven taxi o	drivers killed	in amb		23 Jul 18 05:44 +0200					Ifontein Roode	epoort	ieng south Arnca
Dans le Cam	eroun anglophone, un prêtre assassiné	3	23 Jul 18	fr	$\forall$	1	Not Set	1	0	СМ	_	H 11 Sou	n African Ta	axi Drivers Killed	in Ambush			23 Jul 18 05:37 +0200				قرم	Kg		sburg Boksburg
	ud : onze chauffeurs de taxi abattus à	8	23 Jul 18	fr		1	Not Set	0	0	ZA	_	« <	Page 0	of 1 📎	» C	2				I	No articles to	display	Lenasia	TH	
巛 🔇 🛛 Page	e 1 of 1294  >>> C							Di	splaying ever	nts 1 - 30 of	38797														

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Event Details

# **Event Linking**

Category	Crime Violence	Ľ.
Туре	Terrorist Attack	L
Location	Manchester:Greater Manchester:England:UK	
Dead	19	Ľ
Injured	59	Ŀ
Title	19 killed in blast at Ariana Grande's Manchester concert (Third Lead)	
Description	At least 19 persons were killed and 59 injured in a terror attack here on Monday night at the conclusion of a concert by American pop singer Ariana Grande, police said. The explosion, the second in the city in 21 years, took place around 10.35 p.m. (local time) on Monday at the Manchester Arena	

Category	Crime Violence
Туре	Terrorist Attack
Location	Manchester:Greater Manchester:England:UK
Dead	22
Injured	0
Title	Islamic State claims responsibility in Manchester blast
Description	In a statement, the Greater Manchester Police said that they arrested a 23-year-old man in south Manchester in connection with the attack as hundreds of police swarmed through the city in the aftermath of the blast. Authorities are trying to determine if the suicide bomber acted alone or was[]

		Category	Crime Violence			
	c	Type	Terrorist Attack			
		Location	Manchester:Greater Manchester:England:UK			
		🕈 Dead	22			
.dentity	dependenc	Injured	59			
	a.	Title	Manchester attacker identified as 22-year-old Salman Abedi: Police			
Category	Crime Violence	Description	The man suspected of carrying out an attack at			
Туре	Terrorist Attack		an Ariana Grande concert in Manchester, England,			
Location	Manchester:Greater Manchester:England:UK		Monday that killed 22 people and injured 59 others was identified as			
Dead	19		22-year-old Salman Abedi,			
Injured	59		police said today. Abedi died at the scene after			
Title	'Suspected terror attack' after Ariana Grande gig at Manchester Arena	_	using an improvised explosive device, officials said.			
Description	Nineteen people have died	Category	Crime Violence			
-	and more than 50 others are injured following a	Type	Terrorist Attack			
	suspected terror attack at the Manchester Arena. Greater Manchester Police	Location	Manchester:Greater Manchester:England:UK			
	said the explosion, which	Dead	22			
	happened just before 10.35pm on Monday, is	Injured	0			
	being treated as a suspected terror incident.	Title	Manchester attack: Jihadist celebrates bombing in video			

Features with high discriminative power for event linking:

- Named-Entity Overlap
- Weighthed Content
   Word Overlap
- Hypernym Overlap
- Location Information





#### Italian - German





English - French





Spanish - Portuguese

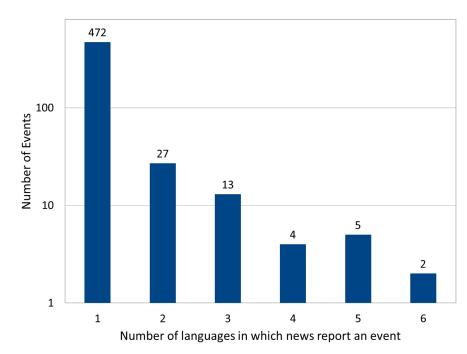




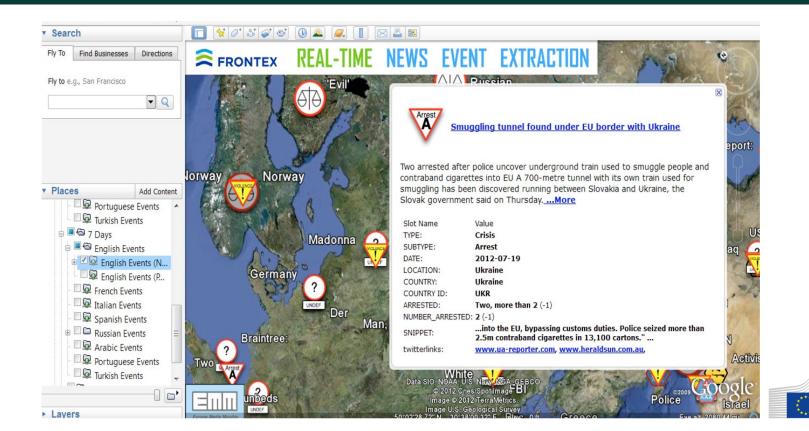
- A random selection of 523 events from 22 non-consecutive days in 2010 (6 languages) ~10% reported in >1 language ~67% reported in non-English news only ~2% reported in non-English news are
  - reported in >1 language

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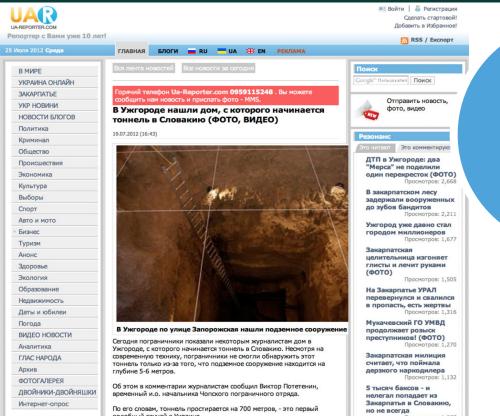






European

Commission



Note that the site is not in English even though the reported event was.



# **EMM Open Source Intelligence Suite**





# **EMM OSINT Suite:** *Acquire Documents*

#### • Web search

- interface for exploiting results returned by most popular search engines
- facility to integrate new search engines
- Crawl of targeted web sites
- Import of local document collections
- Conversion of documents into plain text
  - HTML, PDF, Microsoft Office and Open Office
- Creation of metadata
  - Unique File ID, Acquisition Source, Language ID, ...



# **EMM OSINT Suite:** *Extract Information*

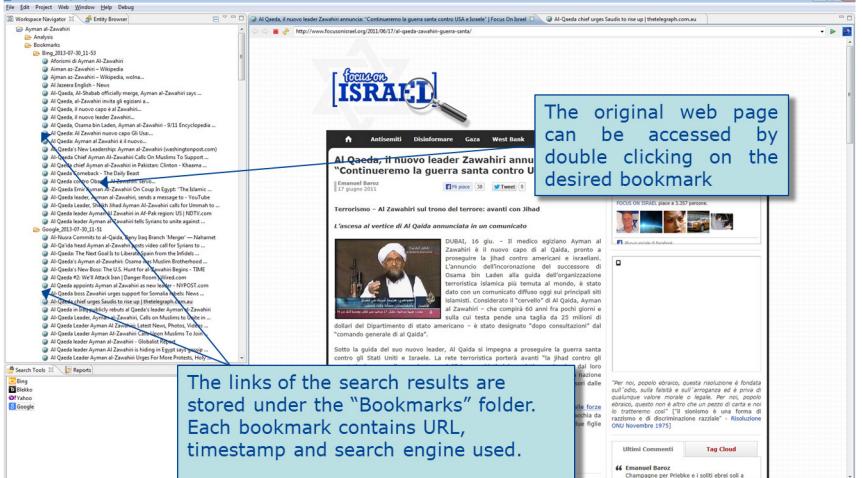
- Extraction of "generic" built-in entity types
  - Person, organisation and location names
  - Time and numeric expressions
  - Identifiers (e.g., email/postal addresses, URLs, IBAN/VAT numbers, phone numbers, currency expressions, etc.)
- Extraction of user-defined entities
  - Lists of known entities and their variants
  - Regular expressions
- Categorisation of documents (simmilar as in EMM/Medisys)



# EMM OSINT Suite: Analyse Data

- Viewing extracted entities in Entity Browser
  - links to documents in which they appear
  - frequency-based list of co-occurring entities
- Creation of entity graph
  - based on co-occurence information
  - to derive intelligence about relationships which are not necessarily obvious
- Creation of reports
  - Predefined (e.g., related entities, list of URLs, etc.)
  - Customised by the user





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#### ALID LICENSE

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Select Project: CaseProjectTerrorists		
		Searc
All entities of project		
Entities	freq	docs
toponym		
A Sperson		
Ayman al-Zawahiri	434	57
Bin Laden	102	16
D Sama bin Laden	96	30
Ayman Al-Zawahiri	80	15
Mohammed	52	19
> Strangest Publishing	36	1
Al Zawahiri	28	11
Al Hilal	26	6
D Stova Dvorin	26	14
Ayman Muhammad Ri	25	16
Ayman al-Zawahri	23	9
Usama bin Laden	21	6
Abu Bakr al-Baghdadi	20	10
Abu Bakr	20	9
b 🚨 L. Mansfield	19	1
a 🧟 Abu Ghaith 🔤	17	2
📄 counterjihad port	16	
i www.theguardial	1	
Ibrahim	17	10
D Sama Bin Laden	15	6
A Strain Stra	14	4
Anwar Sadat	14	10
Sayyid Qutb	2	7
Ayman Al	12	3
Bakr al-Baghdadi	11	8
Vou Might	10	2
Abd Al-Nasser	10	2
Mohammed Rabie	9	3
	^	
Search Tools 🛛 📝 Reports		

- -🔑 smallwarsjournal.com.blog.journal.docs.temp.405.singh.pdf counterjihadreport.com.tag.ayman.al.zawahiri.html News ~ Resources ~ Activism Search Main menu, Tag Archives: Avman al-Zawahiri Post navigation, Posted on September 8, 2014 by Al Oaeda chief Ayman al-Zawahiri, Brian Fairchild: On September 4, 2014, al Qaeda leader Ayman al Zawahiri announced the creation of a new al Qaeda organization called - Qaedat al Jihad in the Indian Subcontinent (QJIS). The mission of the new affiliate is to consolidate the jihad movement in Kashm Bangladesh, Myanmar (formerly Burma), and India, an area that has heretofore been an operational backwater for al Oaeda. This new al Oaeda organization is headed by Asim Umar, a former Pakistani Taliban commander, which may be the key to understanding this new development, and an indicator that Zawahiri is planning to attack the United States, and has the capability to do so. The announcement comes at a time when Zawahiri's ideological and operational leadership over the international jihad movement is being fundamentally challenged in an actual jihadi civil war between his Syrian affiliate, the Nusra Front, and Abu Bakr al Baghdadi's Islamic State of Irag and Syria (ISIS). Clashes between the Nusra Front and ISIS began in early 2013, but increased when al Baghdadi publicly claimed that the Nusra Front was part of ISIS and would be merged with it. Al Nusra's commander Abu Muhammad al Jawlani, however, refused to merge, and the dispute became increasingly violent. Jawlani subsequently appealed to Zawahiri to arbitrate the conflict. Zawahiri sided with al Nusra, and ordered al Baghdadi to dissolve ISIS and return to Iraq. Al Baghdadi, however, dismissed Zawahin's ruling, routed al Nusra from the Syrian city of ar-Ragga and took control of 80 percent of its foreign fighters. ISIS then swept through Syria and Iraq taking control of the cities of Fallujah and Ramadi in the first few days of January 2014. In February 2014, as a direct result of his insubordination and the brutality of his campaign, Zawahiri officially and publicly disowned ISIS. In response, al Baghdadi disdainfully stated "I have to choose between the rule of God and the rule of Zawahiri, and I choose the rule of God", and he continued his conquest. He took Mosul in early June, and then, on June 29, 2014, he announced the creation of the Islamic "caliphate" naming himself as the new leader of all Muslims and calling for all jihad groups to obey him and gather under his banner, and he changed the name of his organization from ISIS to the Islamic State. AI Baghdadi's creation of the "caliphate" is central to understanding the degree to which he has undermined Zawahiri's prestige and authority because it brings to fruition the goal that Zawahiri himself explicitly defined as vital for the success of the jihad movement, as illustrated in the following quote for

loya

book Knights under the Prophet's Banner, published in 2001: "Armies achieve victory only wh movement will not triumph against the world coalition unless it possesses an Islamist base in t that we have reviewed for mobilizing the nation will remain up in the air without a tangible ga state of caliphate in the heart of the Islamic world." That the prized "caliphate" was established face to Zawahiri, and illustrates that this internecine war is not just a spat between jihad group leadership and operational direction of the entire international jihad movement. In addition to believes that maintaining Muslim public support is paramount to the survival of the jihad mov would lose this support, such as rigidly forcing Sharia law on Muslims, conducting sectarian w prisoners. Al Baghdadi, on the other hand, doesn't care about Muslim public opinion, believes law, he actively foments sectarian war between the Sunni and Shia, and he frequently uses the weapon. At present, al Baghdadi's Islamic State, flush with money, manned by a flood of forei and having realized the dream that Zawahiri has always called for - the establishment of the "c problems do not stop there. Not only is the Nusra Front losing, but there is also growing faction over it - one faction wants to rapidly increase the number of foreign fighters into the ranks wit while the other wants to limit such an expansion in order to ensure that all within the Nusra Fr establish an Islamic emirate in Syria to compete with al Baghdadi. It gets worse for Zawahiri. N successes has caused dissention and desertions in the ranks of Zawahiri's heretofore loyal and agair

All named entities recognized in each document are shown in the Entity Browser organized by type (person, organization, toponym, etc.) It also shows the frequency and the number of documents in which each entity appears

After performing the entity extraction, each document can be reviewed using the Document Viewer, highlighting all recognized entities

🗈 🖬 📑 🗉 🗸 📬 🖛 🗖

thin the jihad movement and on the world stage. is the anemic announcement of a new affiliate that will now? In the context of all his tribulations, neither the uncement, and another role for the new affiliate to play. nother successful attack on the American homeland. rated by him and Osama bin Laden, would restore his to claim credit for the attacks, and thus they would have to which may be precisely why he announced the creation of The leadership and operational capability of "core" al

> European Commission

#### **Advanced Extraction Pattern Language**

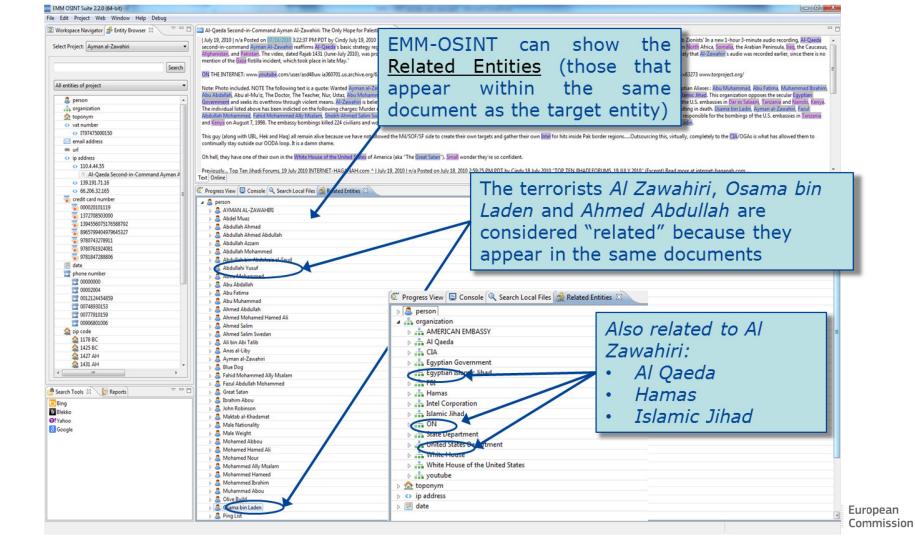
```
person :> ((dictionary & [TYPE: "first_name",
                           SURFACE: #first])
            (dictionary & [TYPE: "initial",
                           SURFACE: #in]
             token & [SURFACE: "."]) ?
            (token & [TYPE: "first_capital_word",
                      SURFACE: #last])):name
-> name: person & [NAME: #full_name,
                   FIRST_NAME: #first,
                   LAST_NAME: #last,
                   TNTTTAL: #in
                   AMOUNT: "1"]
                & #full_name := ConcWithBlanks(#first,#in,#last)
                & ValidatePersonName(#full_name).
```

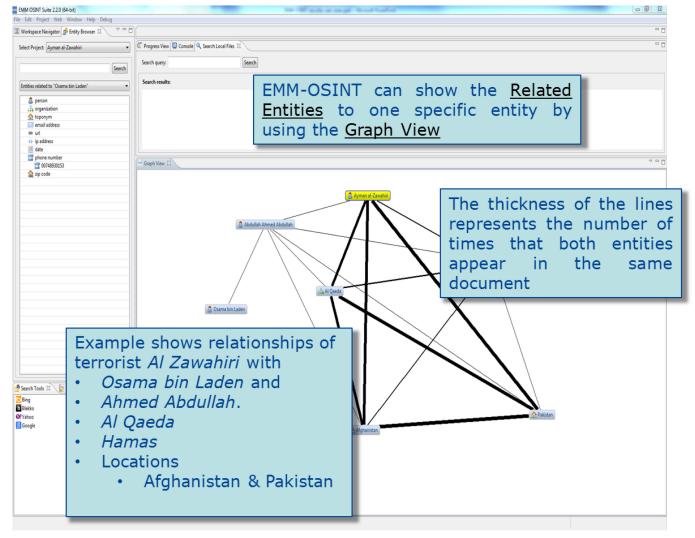


#### **Advanced Extraction Pattern Language**

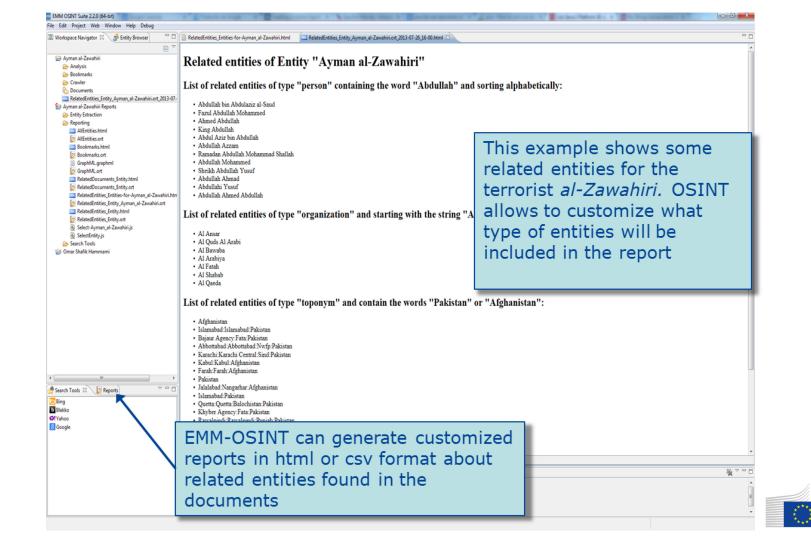
```
credit_card_number :> ( separator
                        ( digit & [SURFACE: #d1]
                          ( digit & [SURFACE: #d2]
                            ( sym & [SURFACE: "-"] )?
                          )+
                        ):card
                        separator
-> card: credit_card_number & [SURFACE: #final_card,
                               ISSUER: #card_type]
                            & #final_card := Trim(#d1,#d2)
                            & #card_type := CreditCardIssuer(#final_card)
                            & LuhnTest(#final_card).
```



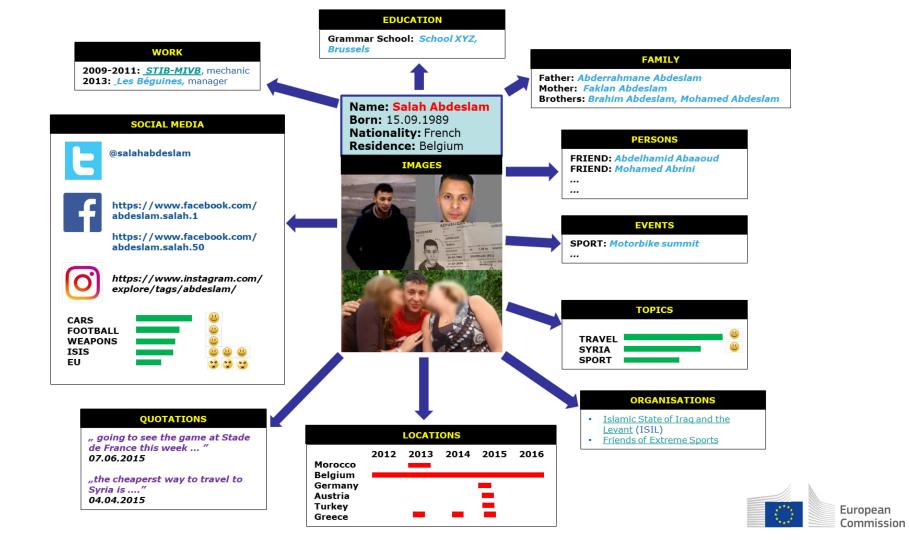








European Commission



#### **Timelines Extraction**

#### TIMELINES EXTRACTION

#### Since 1971, he has chaired The Trump Organization,

the principal holding company for his real estate ventures and other business interests. EVENT TYPE: **MANAGEMENT** EVENT TRIGGER: **has chaired** TIME: **Since 1971** RELATED ENTITIES: ...

Query: Donald Trump

Variants: Trump D. Trump Donald John Trump Trump's Trump was born on June 14, 1946, in Jamaica, Queens, a neighborhood in New York City.

**Trump attended Fordham** 

University in the Bronx for

two years, beginning in

August 1964.

EVENT TYPE: **BIRTH** EVENT TRIGGER: **was born** TIME: **June 14, 1946** RELATED ENTITIES: **Jamaica, Queens, New York City** 

EVENT TYPE: **PARTICIPATION** EVENT TRIGGER: **attended** TIME: **August 1964** RELATED ENTITIES: **Fordham University, Bronx** 

While there, from **1968** he worked at the family's company, Elizabeth Trump & Son, named for his paternal grandmother.



EVENT TYPE: **WORK-FOR** EVENT TRIGGER: **worked at** TIME: **1968** RELATED ENTITIES: ...



#### References

- EMM Newsbrief: <u>http://emm.newsbrief.eu</u>
- Medisys: <a href="http://medisys.newsbrief.eu/">http://medisys.newsbrief.eu/</a>
- Event Extraction (KML): <a href="http://labs.emm4u.eu/view.kml">http://labs.emm4u.eu/view.kml</a>
- EMM OSINT Suite:

https://wiki.emm4u.eu/confluence/display/osintpublic/EMM+Open+So urce+Intelligence+Suite

- EMM Language Technology Resources: <u>https://ec.europa.eu/jrc/en/language-technologies</u>
- More: <u>http://emm.newsbrief.eu/overview.html</u>



# **OSINT Workshop**

- When: 25-27 September (3 full days)
- Where: Villa Cagnola, Gazzada, Italy (http://www.villacagnola.it/)
- What:
  - Sharing experience of using OSINT tools/methods
  - Latest Developments in Research
  - Tutorials (EMM News Desk, OSINT Suite, Advanced Topics IE, Machine Learning)
- Audience:
  - MS experts from national authorities
  - Practitioners from EC and other EU institutions
- More Info: Jakub.Piskorski@ec.europa.eu





# Thank you!

#### Any questions?

You can find us at **<u>JRC-TMA-CC@ec.europa.eu</u>** 

EMM support: <u>JRC-EMM-SUPPORT@ec.europa.eu</u>

