Case World War I as Linked Data
– yhteistyötä yli rajojen

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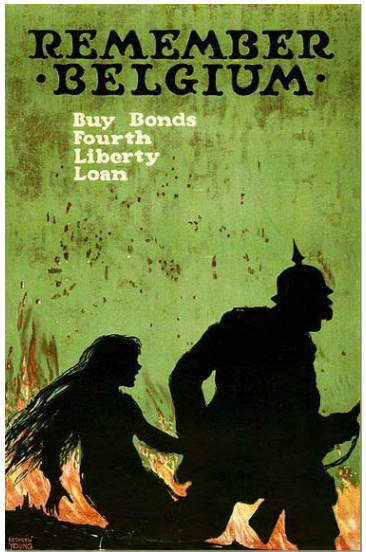

Research Goals

- **Aggregating** WWI data across boaders
  - Based on a shared history ontology
- **Enriching** Cultural Heritage by linking data
  - E.g. paintings, books, artifacts, news, photographs, …
- **Supporting** Digital Humanities research
  - Prodividing new insight to history based on Linked Data

London, [1915]
Collection of the Library of Congress

Linked Open Data Cloud 2011:

http://linkeddata.org

WWI data could be a bubble here?

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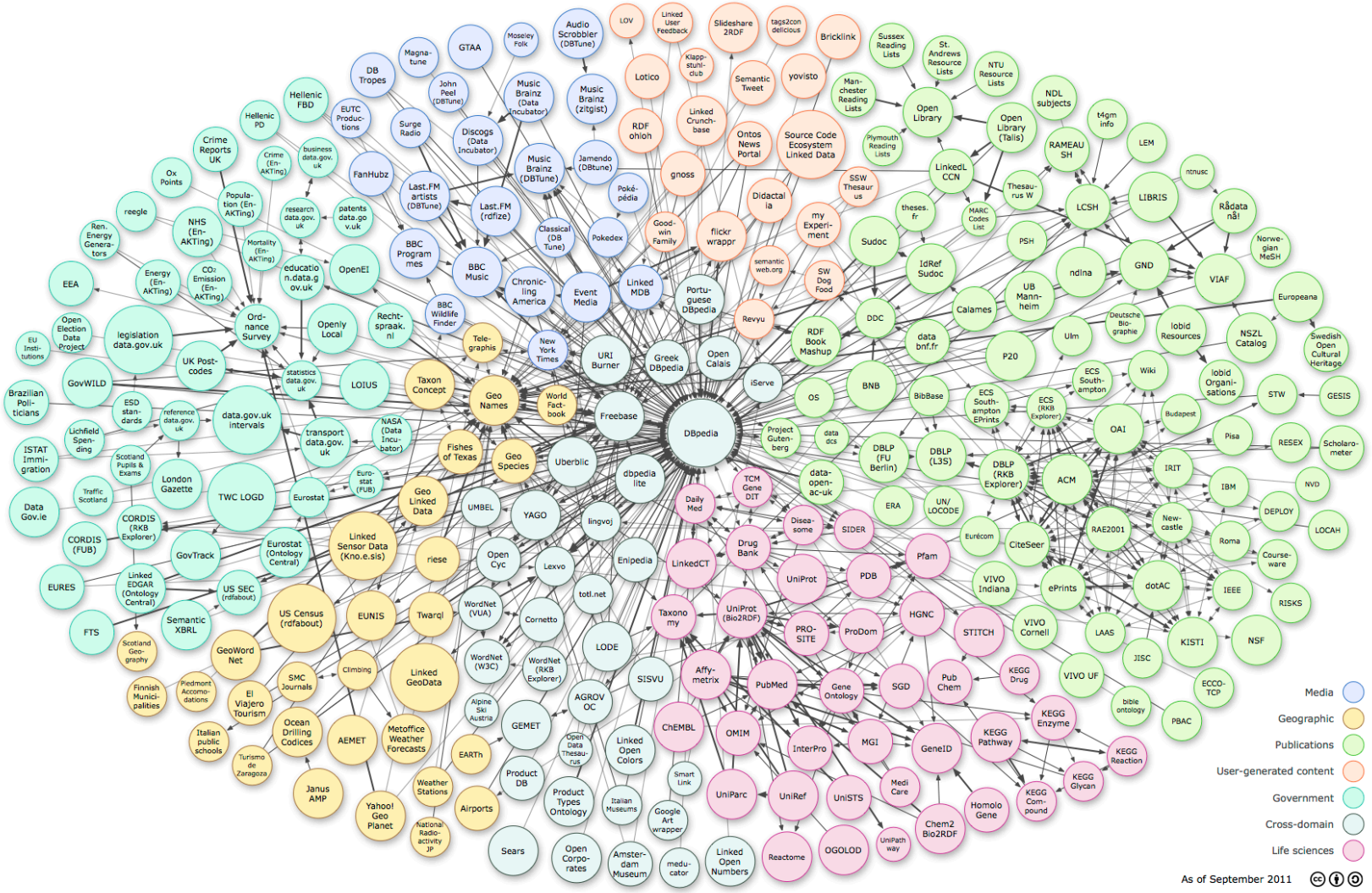

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Research Focus:
Historical Events Fostering Linked Data

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- Events are a basis for modern metadata models
  - Generic event-centric schema ontologies
  - CIDOC CRM, LIDO,…
- Events = semantic glue linking cultural heritage (CH) content
  - Persons, organizations
  - Places
  - Times
  - Artifacts
  - Intangible things
  - Other events
- **We consider vocabularies of particular historical events**
  - “Crucifixion of Jesus”, “Coronation of Napoleon I”, “World War I”

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- There are controlled vocabularies / gazetteers for
  - Persons, organizations
    - » E.g. ULAN, authority files
  - Places (modern & historical)
    - » E.g. TGN, Geonames, GNS, local databases
  - Artifacts
    - » E.g. AAT, MASA/MAO,
  - …
- **Controlled vocabularies for events are missing!**
  - We propose semantic web ”event gazetteers”

Contributions of Our Work

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- Analyze requirements for an event gazetteer
  - From a Linked Open Data perspective
- A metadata model for representing events
- Application case study: World War I
  - Gazetteer of WWI events
  - Semantic portal for WWI

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Requirements for an Event Gazetteer of History

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Requirements for Usage

- Use as a gazetteer
  - Shared reference IDs glue data together
- Use as a data repository
  - Event timeline with descriptions
- Use metadata schema for representing events

Requirements for Linked Data

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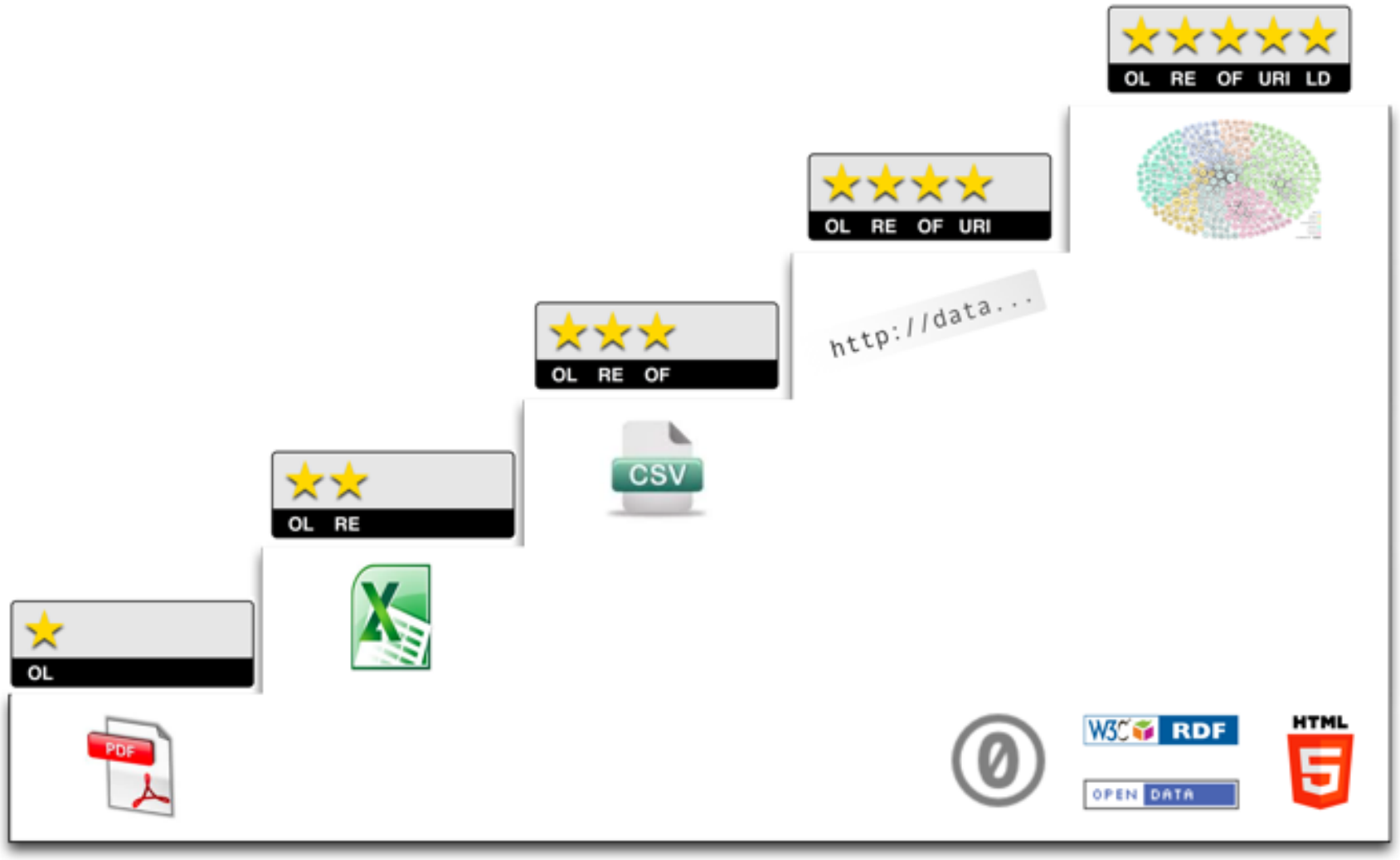

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- Earning 5 stars in our case:
  - ★ The structured semantic data based on RDF, SKOS, OWL is used
  - ★ The Open Creative Commons Attribution License is used
  - ★ The W3C and other non-proprietary and open standards are used
  - ★ Dereferencable HTTP URIs are used, according to LD principles
    - ★ RDF for machines
    - ★ HTML for humans
  - ★ The data is linked to related repositories
    - ★ E.g. DBpedia and Geonames in Linked Open Data cloud, LCSH, …
    - ★ Collections of WWI materials

Requirements for Interfaces and APIs

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- **Human interface.** Human end-user-interface
  - For search engines and browsers
- **Linked Data browsing.** Linked Data browser interface based on URI dereferencing
  - LD browsers created for the Web of Data.
- **SPARQL endpoint.** For querying the data in a standard way for, e.g., mash-up applications
- **Download**. Downloading the data as an RDF data dump

Requirements for Identifiers

- Use HTTP Universal Resource Identifiers (URI)
  - Unique **identifiers** for anything (inside or outside WWW)
    - » Based on Domain Name System of WWW
      - E.g. http://www.cidoc-crm.org/
  - Like web **addresses**
    - » URI identifier also tells where the data is
      - Can be used e.g. in a browser!
    - » Not all URI schemas have this property
      - E.g. URN identifiers
      - Not recommended for Linked Data!
  - **Persistence** – ”cool URIs do not change”

Example: Challenges in Indentifying Events

- How to represent the ”Battle of Albert” in WWI
- What language to use?
  - Bataille d'Albert? (fr)
  - Albertin taistelu? (fi)
- Which battle?
  - Battle of Albert (1914) (25–29 September 1914)
    - » encounter battle during the Race to the Sea
  - Battle of Albert (1916) (1–13 July 1916)
    - » opening phase of the Battle of the Somme, 1916
  - Battle of Albert (1918) (21–23 August 1918)
    - » opening phase of the Second Battle of the Somme, 1918
- Is “Battle of Albert” a Web page, a concept and/or identifier?

Linked Data Solution in DBpedia: Dereferencing ”Battle of Albert, 1914”

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- Web of Data (GGG) for machines:
  - URI indentifier
    - » http://dbpedia.org/**resource**/Battle_of_Albert_%281914%29
  - Web page URL
    - » http://dbpedia.org/**page**/Battle_of_Albert_%281914%29
  - (Meta)data on the web
    - » http://dbpedia.org/**data**/Battle_of_Albert_%281914%29

- Web of Pages (WWW) for humans:
  - The actual Wikipedia information page
    - » http://en.wikipedia.org/wiki/Battle_of_Albert_(1914)

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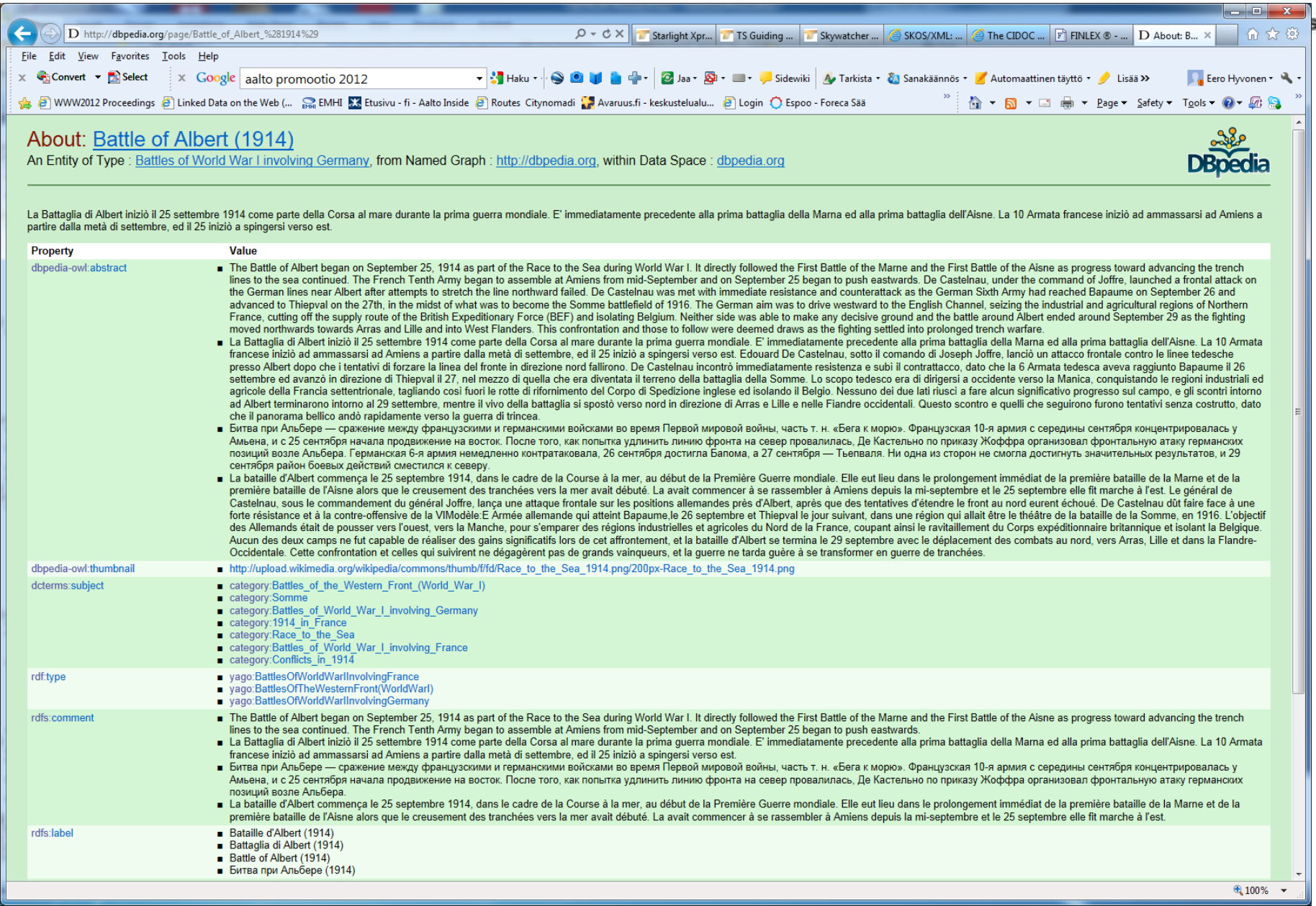
http://dbpedia.org/page/Battle_of_Albert_%281914%29



http://dbpedia.org/page/Battle_of_Albert_%281914%29

File Edit View Favorites Tools Help

About: Battle of Albert (1914)

An Entity of Type : Battles of World War I involving Germany, from Named Graph : http://dbpedia.org, within Data Space : dbpedia.org

La Battaglia di Albert iniziò il 25 settembre 1914 come parte della Corsa al mare durante la prima guerra mondiale. E' immediatamente precedente alla prima battaglia della Marna ed alla prima battaglia dell'Aisne. La 10 Armata francese iniziò ad ammassarsi ad Amiens a partire dalla metà di settembre, ed il 25 iniziò a spingersi verso est.

Property	Value
dbpedia-owl:abstract	■ The Battle of Albert began on September 25, 1914 as part of the Race to the Sea during World War I. It directly followed the First Battle of the Marne and the First Battle of the Aisne as progress toward advancing the trench lines to the sea continued. The French Tenth Army began to assemble at Amiens from mid-September and on September 25 began to push eastwards. De Castelnau, under the command of Joffre, launched a frontal attack on the German lines near Albert after attempts to stretch the line northward failed. De Castelnau was met with immediate resistance and counterattack as the German Sixth Army had reached Bapaume on September 26 and advanced to Thiepval on the 27th, in the midst of what was to become the Somme battlefield of 1916. The German aim was to drive westward to the English Channel, seizing the industrial and agricultural regions of Northern France, cutting off the supply route of the British Expeditionary Force (BEF) and isolating Belgium. Neither side was able to make any decisive ground and the battle around Albert ended around September 29 as the fighting moved northwards towards Arras and Lille and into West Flanders. This confrontation and those to follow were deemed draws as the fighting settled into prolonged trench warfare. ■ La Battaglia di Albert iniziò il 25 settembre 1914 come parte della Corsa al mare durante la prima guerra mondiale. E' immediatamente precedente alla prima battaglia della Marna ed alla prima battaglia dell'Aisne. La 10 Armata francese iniziò ad ammassarsi ad Amiens a partire dalla metà di settembre, ed il 25 iniziò a spingersi verso est. Edouard De Castelnau, sotto il comando di Joseph Joffre, lanciò un attacco frontale contro le linee tedesche presso Albert dopo che i tentativi di forzare la linea del fronte in direzione nord fallirono. De Castelnau incontrò immediatamente resistenza e subì il contrattacco, dato che la 6 Armata tedesca aveva raggiunto Bapaume il 26 settembre ed avanzò in direzione di Thiepval il 27, nel mezzo di quella che era diventata il terreno della battaglia della Somme. Lo scopo tedesco era di dirigersi a occidente verso la Manica, conquistando le regioni industriali ed agricole della Francia settentrionale, tagliando così fuori le rotte di rifornimento del Corpo di Spedizione inglese ed isolando il Belgio. Nessuno dei due lati riuscì a fare alcun significativo progresso sul campo, e gli scontri intorno ad Albert terminarono intorno al 29 settembre, mentre il vivo della battaglia si spostò verso nord in direzione di Arras e Lille e nelle Fiandre occidentali. Questo scontro e quelli che seguirono furono tentativi senza costrutto, dato che il panorama bellico andò rapidamente verso la guerra di trincea. ■ Битва при Альбере — сражение между французскими и германскими войсками во время Первой мировой войны, часть т. н. «Бега к морю». Французская 10-я армия с середины сентября концентрировалась у Амьена, и с 25 сентября начала продвижение на восток. После того, как попытка удлинить линию фронта на север провалилась, Де Кастельно по приказу Жоффра организовал фронтальную атаку германских позиций возле Альбера. Германская 6-я армия немедленно контратаковала, 26 сентября достигла Бапома, а 27 сентября — Тьепваля. Ни одна из сторон не смогла достигнуть значительных результатов, и 29 сентября район боевых действий сместился к северу. ■ La bataille d'Albert commença le 25 septembre 1914, dans le cadre de la Course à la mer, au début de la Première Guerre mondiale. Elle eut lieu dans le prolongement immédiat de la première bataille de la Marne et de la première bataille de l'Aisne alors que le creusement des tranchées vers la mer avait débuté. La avait commencer à se rassembler à Amiens depuis la mi-septembre et le 25 septembre elle fit marche à l'est. Le général de Castelnau, sous le commandement du général Joffre, lança une attaque frontale sur les positions allemandes près d'Albert, après que des tentatives d'étendre le front au nord eurent échoué. De Castelnau dût faire face à une forte résistance et à la contre-offensive de la VIModèle:E Armée allemande qui atteint Bapaume,le 26 septembre et Thiepval le jour suivant, dans une région qui allait être le théâtre de la bataille de la Somme, en 1916. L'objectif des Allemands était de pousser vers l'ouest, vers la Manche, pour s'emparer des régions industrielles et agricoles du Nord de la France, coupant ainsi le ravitaillement du Corps expéditionnaire britannique et isolant la Belgique. Aucun des deux camps ne fut capable de réaliser des gains significatifs lors de cet affrontement, et la bataille d'Albert se termina le 29 septembre avec le déplacement des combats au nord, vers Arras, Lille et dans la Flandre-Occidentale. Cette confrontation et celles qui suivirent ne dégagèrent pas de grands vainqueurs, et la guerre ne tarda guère à se transformer en guerre de tranchées.
dbpedia-owl:thumbnail	■ http://upload.wikimedia.org/wikipedia/commons/thumb/f/fd/Race_to_the_Sea_1914.png/200px-Race_to_the_Sea_1914.png
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rdfs:comment	■ The Battle of Albert began on September 25, 1914 as part of the Race to the Sea during World War I. It directly followed the First Battle of the Marne and the First Battle of the Aisne as progress toward advancing the trench lines to the sea continued. The French Tenth Army began to assemble at Amiens from mid-September and on September 25 began to push eastwards. ■ La Battaglia di Albert iniziò il 25 settembre 1914 come parte della Corsa al mare durante la prima guerra mondiale. E' immediatamente precedente alla prima battaglia della Marna ed alla prima battaglia dell'Aisne. La 10 Armata francese iniziò ad ammassarsi ad Amiens a partire dalla metà di settembre, ed il 25 iniziò a spingersi verso est. ■ Битва при Альбере — сражение между французскими и германскими войсками во время Первой мировой войны, часть т. н. «Бега к морю». Французская 10-я армия с середины сентября концентрировалась у Амьена, и с 25 сентября начала продвижение на восток. После того, как попытка удлинить линию фронта на север провалилась, Де Кастельно по приказу Жоффра организовал фронтальную атаку германских позиций возле Альбера. ■ La bataille d'Albert commença le 25 septembre 1914, dans le cadre de la Course à la mer, au début de la Première Guerre mondiale. Elle eut lieu dans le prolongement immédiat de la première bataille de la Marne et de la première bataille de l'Aisne alors que le creusement des tranchées vers la mer avait débuté. La avait commencer à se rassembler à Amiens depuis la mi-septembre et le 25 septembre elle fit marche à l'est.
rdfs:label	■ Bataille d'Albert (1914) ■ Battaglia di Albert (1914) ■ Battle of Albert (1914) ■ Битва при Альбере (1914)

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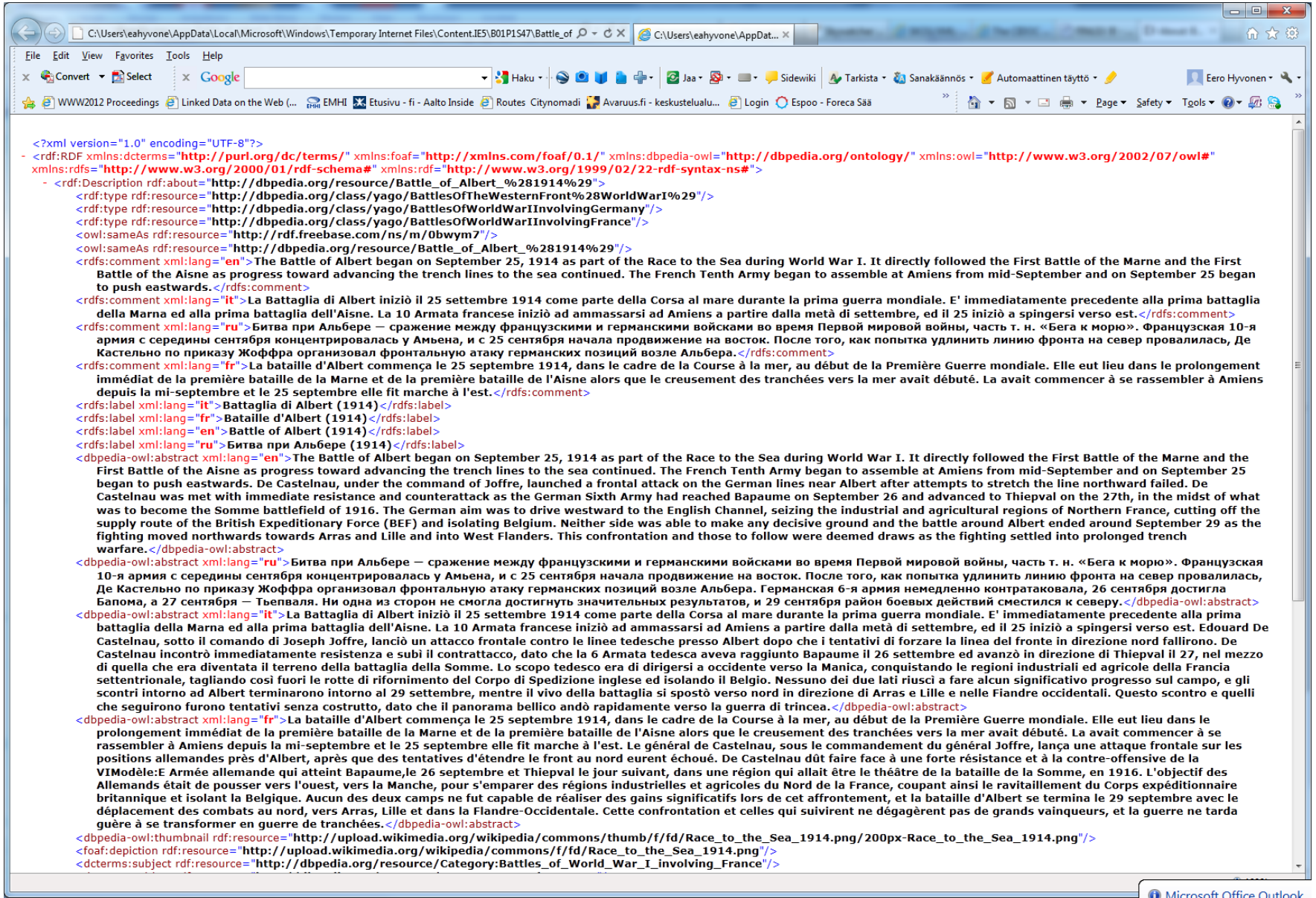

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http://en.wikipedia.org/wiki/Battle_of_Albert_(1914)

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Requirements for Core Metadata

- Minimal metadata to identify an event unambiguosly
  - Name
  - Time
  - Place
  - Description
- Visualizied by pattern *name*(*time*, *place*)
- Examples:
  - Battle of Albert (1914, France)
  - World War I (1914-1918, Belgium)
  - World War I (1914-1918, Germany)

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Metadata Elements for Historical Events

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Metadata type	Label	Meaning	Identifier	Cardinality	Range	Value
Core elements						
Name	name	Short event name	:name	0..1	Literal	string@languge
	full name	Full event name	skos:prefLabel	1	Literal	string@languge
Description	description	Description of the event	dc:description	0..1	Literal	string@languge
Time	time	Time span of the event	:time	1	Time instance	Time URI
Place	place	Place where the event took place	:place	1	Place instance	Place URI
	point		geo:point	0..1	Point instance	Point URI
	path		geo:line	0..1	Line instance	Line URI
	area		geo:polygon	0..1	Polygon instance	Polygon URI
Subject						
Subject matter	related actor	Actor involved in the in the event	:subjectActor	0..n	Actor instance	Actor URI
	related time	Other time related to the event	:subjectTime	0..n	Time instance	Time URI
	related place	Other place related to the event	:subjectPlace	0..n	Place instance	Place URI
	related event	Other event related to the event	:subjectEvent	0..n	Event instance	Event URI
	related topic	Topic concept related to the event	:subjectConcept	0..n	Concept	Topic URI
	related object	Individual object related to the event	:subjectObject	0..n	Object instance	Object URI
classification	event type		:eventType	0..n	Concept	Classification URI
Narrative						
Event hierarchy	is contained in	Larger event	skos:broader	0..n	Event instance	Event URI
	contains	Narrower event	skos:narrower	0..n	Event instance	Event URI
Event succession	next event	Next event	:next	0..n	Event instance	Event URI
	previous event	Previous event	:previous	0..n	Event instance	Event URI
Causal structure	cause	Cause of the event	:cause	0..n	Event instance	Event URI
	effect	Effect of the event	:effect	0..n	Event instance	Event URI
Administrative						
	Documentation properties	SKOS Documentation properties	skos:*xxx*	0..n	Literal	string@language

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An Event Gazetteer and Timeline for World War I

Aalto University

- Represent the events and story of WWI as LOD
- Publish WWI events as a 5 star RDF LOD repository & service
- Link it with relevant ontologies and datasets
- Joint work of Aalto University, University of Colorado Boulder, and University of Helsinki
  - With an international collaboration network

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Data Sources

- Wikipedia/DBpedia WWI timeline and events
- *Principal Events, 1914-1918* (London, 1922)
  - British government's view of the war proceedings
  - Appendix provides German, Belgian, French and American views
- Imperial War Museum (London) data
  - Geographical terms relating to the Western Front
  - Event terms relating to WWI
- Horne & Kramer, *German Atrocities, 1914* (New Haven, 2001)
  - Atrocity data
- Tessin, *Deutsche Verbände und Truppen* (Osnabrück, 1974)
  - German army hierarchy
- *Annuaire Statistique de la Belgique* (Brussels, 1922)
  - Government data about Belgian population, economy, etc. for war years
- Polygons of Belgian provinces during WWI
  - HISSTAT project (Universities of Ghent, Brussels, Louvain-la-Neuve and State Archives of Belgium)

- Collections
  - University of Colorado Boulder, WWI Collection Online
  - Over 1,100 titles (55,000 pages)
  - Published 1829-1922, vast majority 1914-1918
- Articles
  - DBpedia
  - Collaboration with other WWI projects
- Ontologies
  - Annotated event gazetteer of WWI
  - Ontologies of agents, regions, and times
  - Places mapped on Geonames
- Specialized vocabulary relating to WWI Belgium

Annotation Process

Aalto University

- Collection MARCXML -> RDF
  - Transformation by machine
- Manual deep linking based on content
  - Strings in text -> URI references
- Manual creation of additional ontologies and metadata
- Automatic annotation of texts
  - DBpedia Spotlight
  - Work in progress

http://libcudl.colorado.edu/wwi/index.asp

Aalto University

Example from Principal Events (1922)

30th ... Fort Thiaumont (Verdun) retaken by French forces (see 23rd, and July 1st).
Battle of the Strypa ends (see 11th).
British Government conclude further agreement with the Netherlands Overseas Trust for rationing of Holland (see November 23rd, 1915).

JULY 1916.

1st ... **Battles of the Somme, 1916, begin** with Battle of Albert, 1916 (1st/13th) (see November 18th).
Contact patrol, or liaison with infantry, first instituted in the Royal Flying Corps.
Kirmanshah (Persia) reoccupied by Turkish forces (see February 26th, 1916, and March 11th, 1917).

2nd ... **Battle of Baranovichi begins** (see 9th).

3rd ... Russian and Japanese Governments conclude treaty with regard to future policy in the Far East.

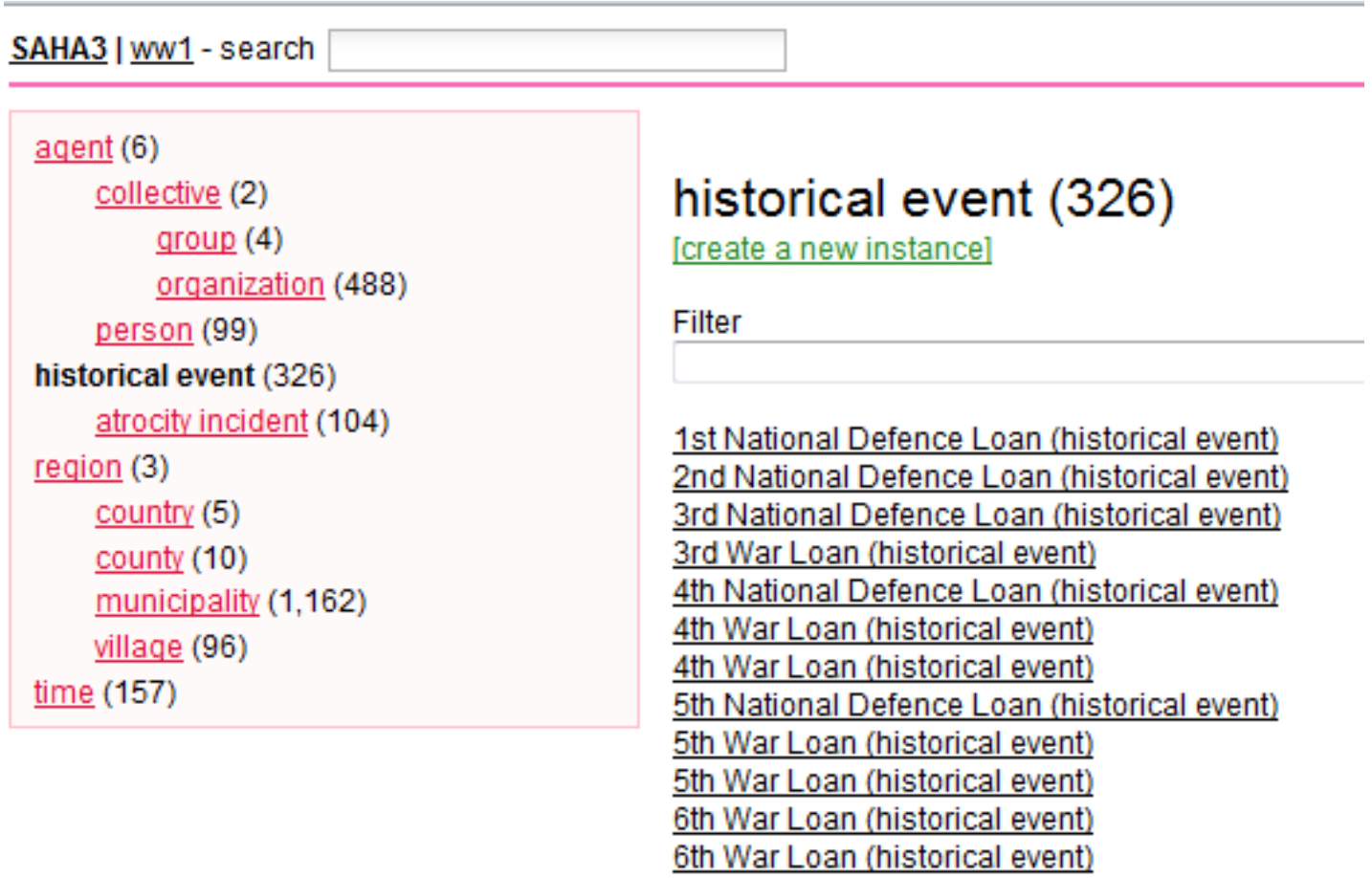
7th ... **Italian counter-offensive in the Trentino ends** (see June 16th).
Tanga (German East Africa) occupied by British forces (see November 5th, 1914).
Mr. Lloyd George succeeds Lord Kitchener as Secretary of State for War, Great Britain (see June 5th and December 11th).
British Government issue Order in Council rescinding Declaration of London of 1909. French Government issue similar order (see October 29th, 1914, and November 6th, 1914).

* Bulk of position was captured on May 23rd, and this date marks the limit of the German advance on Verdun.

Creating Metadata about WWI Events: Classes and Instances in SAHA Editor

Aalto University

Collaborative annotation project (Aalto & CU Boulder)



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Towards a Semantic Portal: Faceted Search for Atrocities

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[-] agent

100th Infantry Regiment	1
101st Infantry Regiment	1
103rd Infantry Regiment	1
108th Infantry Regiment	1
119th Infantry Regiment	1
11th Field Artillery Regiment	1
121st Infantry Regiment	1
122nd Infantry Regiment	1
125th Infantry Regiment	1
127th Infantry Regiment	1
12th Field Artillery Regiment	1
12th Reserve Infantry Regiment	1
178th Infantry Regiment	1
182nd Infantry Regiment	1
202nd Reserve Infantry Regiment	1
203rd Reserve Infantry Regiment	1
204th Reserve Infantry Regiment	1
48th Field Artillery Regiment	1

[-] deportations

yes	8

[-] combat related

no	2
yes	6

[-] human shields

no	6
yes	2

[+] killings

[-] panic

no	8

List Map

Results 8

[remove] ***no***

[remove] ***yes***

- Atrocities in Baranzy (atrocity incident)
- Atrocities in Dinant (atrocity incident)
- Atrocities in Esen (atrocity incident)
- Atrocities in Flénu (atrocity incident)
- Atrocities in Korbeek-Lo (atrocity incident)
- Atrocities in Rotselaar (atrocity incident)
- Atrocities in Somme-Leuze (atrocity incident)
- Atrocities in Zempst (atrocity incident)

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Visualizing Search Results on a Map & Timeline

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[+] agent

[-] combat related

no	32
yes	62

[-] deportations

no	83
yes	13

[+] destroyed buildings

[-] human shields

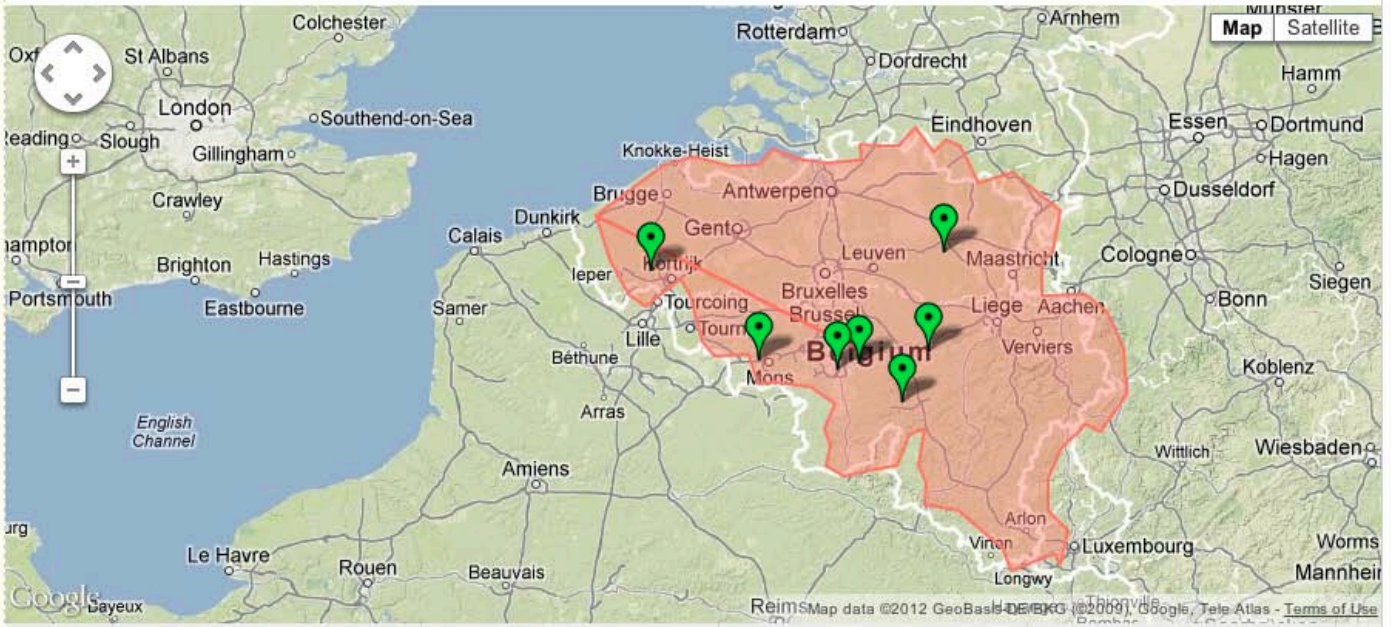
no	70
yes	26

[+] killings

[-] panic

no	70
yes	25

List Map



- Atrocities in Berneau
- Atrocities in Micheroux
- Atrocities in Poulseur
- Atrocities in Soumagne
- Atrocities in Battice
- Atrocities in Esneux
- Atrocities in Hermée
- Atrocities in Blégny-Trembleur
- Atrocities in Magnée
- Atrocities in Olne-St Hadelin
- Atrocities in Romsée
- Atrocities in Retinne
- Atrocities in Sprimont
- Atrocities in Warsage
- Atrocities in Herstal
- Atrocities in Lixhe
- Atrocities in Louveigné

declaration of War on Germany

Timeline © SIMILE

May | Jun | Jul | Aug | Sep

End-user Interface: Events on the Map and Timeline: Battle of Albert 1914

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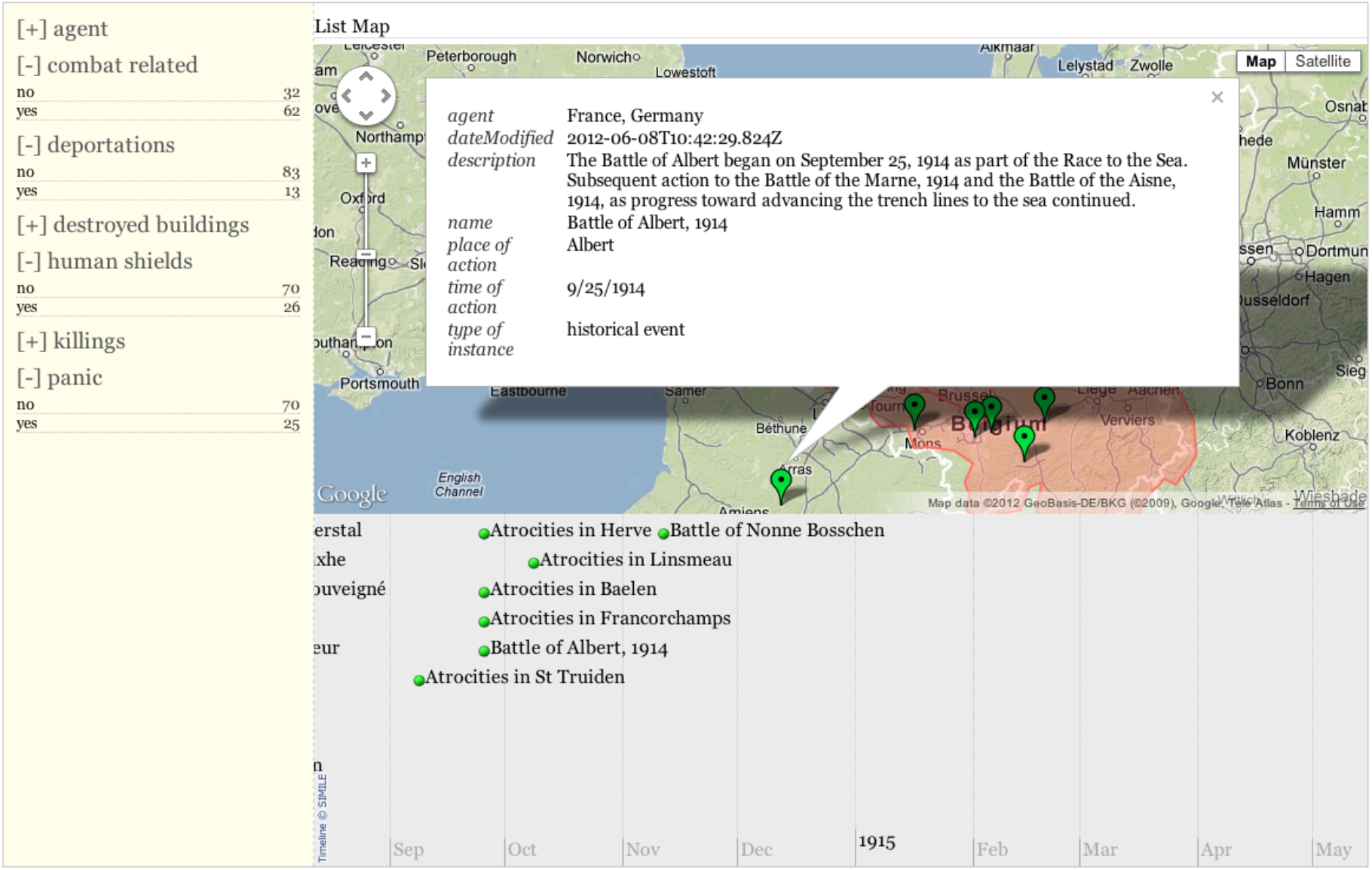
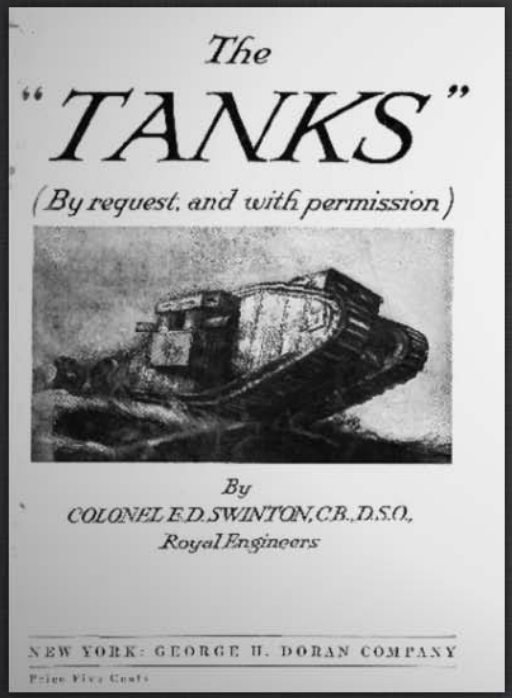


Yet Another Demo System

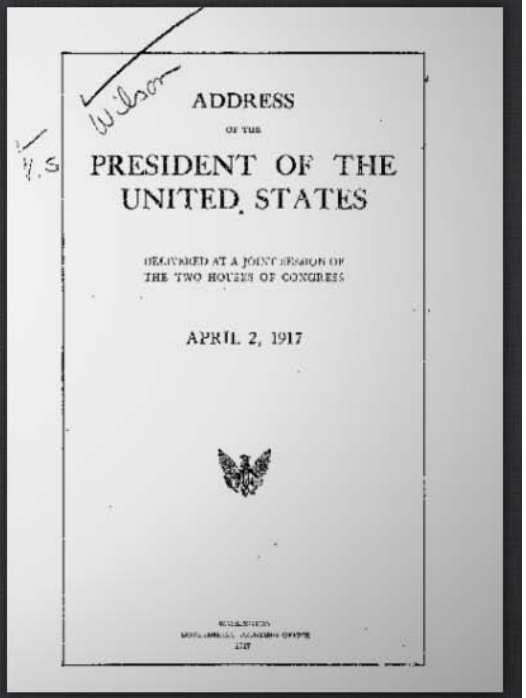
Aalto University

WW1LOD
DEMO

Documents related to


The
"TANKS"
(By request, and with permission)
By
COLONEL E.D.SWINTON,C.B.,D.S.O.,
Royal Engineers
NEW YORK: GEORGE H. DORAN COMPANY

THE COMMEMORATIVE MEDAL IN THE SERVICE OF GERMANY
BY
G. F. HILL, M.A.
LONGMANS, GREEN AND CO.


Wilson
ADDRESS
OF THE
PRESIDENT OF THE UNITED STATES
DELIVERED AT A JOINT SESSION OF THE TWO HOUSES OF CONGRESS
APRIL 2, 1917

Aalto University

World War I Linked Open Data

Linked Data Finland

★★★★★

Home

Project

Datasets

Schemas

Services

Policies

Documentation

Validation

Applications

Your Data?

This dataset is a result of research collaboration between Aalto University and University of Colorado (UC), Boulder. The data contains ontologies describing hundreds of events that took place during World War I, places, persons etc. This data has been used for annotating a WWI collection of UC. An search application on top of the LDF.fi SPARQL service has been created.

More information about this project can be found on the History on the Semantic Web project page.

Download

Select link for downloading a graph in the service (i.e., dataset) in Turtle format:

- World War I and Document Collection

Schemas Used

Following schemas are used in the datasets above:

No schemas are available for these datasets.

URI Data Services

Give the URI without brackets (<>) and without encoding.

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Conclusions

- History is a promising application area for Linked Data
- **Event gazetteers are missing**
- We presented a model for this based on LD requirements
- Application demo system is underway
  - Populating a gazetteer/timeline for WWI
  - Aggergating Linked Data form other WWI-projects
  - Creating a semantic portal for WWI
- Acknowledgements
  - Michael Ortiz, Martha Hanna, Nina Laurenne, …
  - Fulbright Foundation, Tekes, Finnish Cultural Foundation
- More info: http://www.seco.tkk.fi/projects/history/