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- **LIMSI-CNRS**

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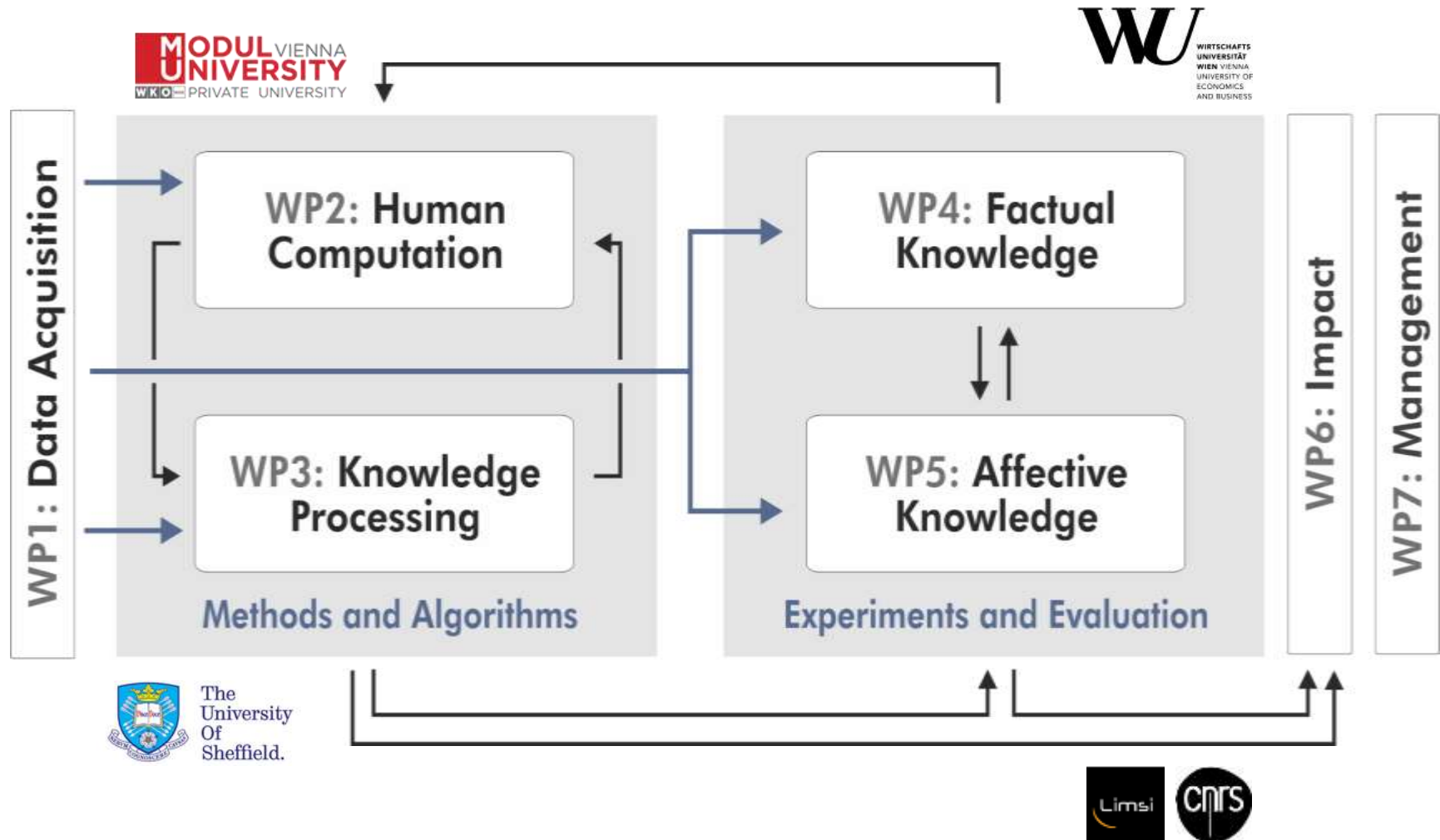
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- Develop a generic and reusable **Human Computation (HC)** framework
- Address challenges of **noisy data**
- Embed human computation into **knowledge extraction** workflows
 - Factual Knowledge
 - Affective Knowledge
- **Evaluate** EHC performance
(EHC = Embedded Human Computation)

Work Package Overview



- Extensible Web Retrieval Toolkit (eWRT)
 - Open Source Library
www.weblyzard.com/ewrt
- Media Watch on Climate Change
 - English Version
 - www.ecoresearch.net/climate
 - News Media Articles: **1,275,000**
 - Social Media Postings: **20,000,000**
 - German Version
 - www.ecoresearch.net/climate/de
 - News Media Articles: **650,000**
 - Social Meeting Postings: **565,000**
 - French Version
 - www.ecoresearch.net/climate/de
 - News Media Articles: **720,000**
 - Social Meeting Postings: **410,000**



- **Application Framework.** Facilitate developing GWAPs to engage users and generate valuable information.
- **Mechanism.** Players score if **inputs match**: (i) system-generated values; (ii) Real-time input from other players; (iii) stored records from previous users.
- If a certain number of players **agree**, the task will be assumed **complete** and taken out of the game
- **Progress**
 - **Cross-platform HTML5 application framework. Complete.**
 - **Application Programming Interface (API). Complete.**
 - **Integration of GWAPs with CrowdFlower. Complete.**
 - **Support of Prediction Tasks. Complete.**
 - **Framework for Social Logins. Complete.**

Climate challenge
test your climate knowledge - predict the future state of our world



Launch – 25 Mar 2015
www.twitter.com/uCompEU

GWAP Use Case

Play Progress **Leaderboard** About



Sentiment Assessment ?

Does the following term have a **negative**, neutral or **positive** meaning?

energy conservation



Game Level

1

Level

↑ +5



15



You



105



300






335

Current Questions

OPEN QUESTIONS

- How much warmer or colder than average will sea surface temperature be in April 2015 in the eastern tropical Pacific Ocean (the Niño 3.4 region)?

Top Scores March ★

1		Christoph Meili Level: 3	1150
2		Diana Maynard Level: 3	950
8		Antonio Panderas Level: 1	100

- **Open-source, released as part of GATE**
gate.ac.uk/wiki/crowdsourcing.html
- **Two types of tasks: (i) Classification - e.g. entity/word disambiguation, sentiment; (ii) sequence selection - e.g. named entity annotation**
- **Tasks commissioned from the GATE Developer UI**
- **Automatic mapping from sentences to HC tasks**
- **Annotation provenance & contributor reliability tracked**
- **Collected data mapped back onto corpora and documents automatically**
- **Several knowledge aggregation and corpus distribution methods implemented (T3.3)**

- One entity class per crowdsourcing task; better than simultaneous annotation of entity types

Click to mark the words that are part of location names

In each sentence below, mark any names that are locations (e.g. **France**). Don't mark locations that don't have their own special name.

There may be no locations in the sentence at all - that's OK.

Come on folks of # **wigan** True r False there 's a nutter hanging about **wigan** with a gun. **Darlington** **st** area ?

After marking: (required)

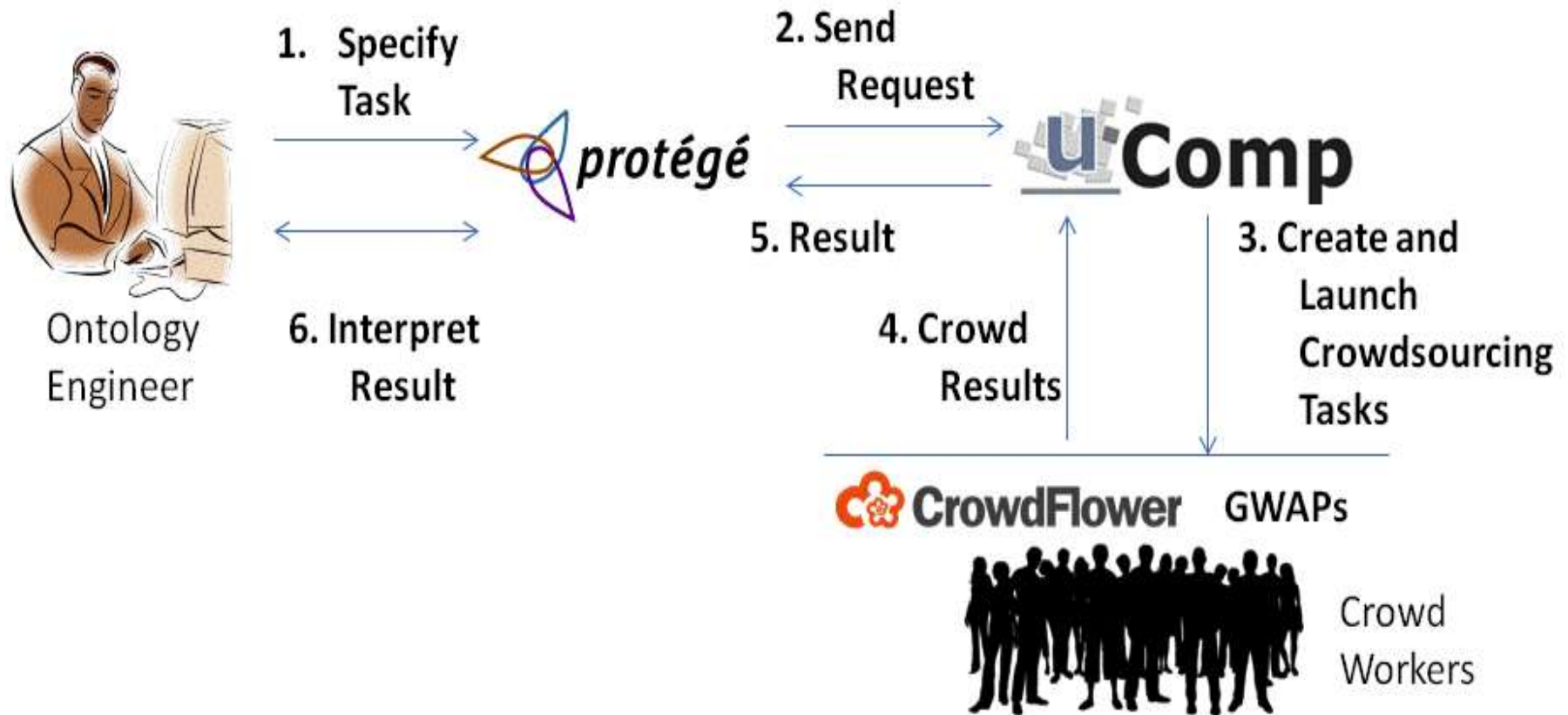
- All the location names in this sentence are now marked
- This sentence contains no proper location names

- Automatic adjudication/aggregation strategies implemented
- Challenges encountered
 - Worker agreement not always representative of quality
 - Many entities are recognised by only a minority of workers
 - Regional knowledge is required: #mufc, the bulls
 - Span mismatch: King of England vs King of England
- Quality evaluation
 - PER P 68.7 R 56.2 F1 61.8
 - LOC P 15.3 R 91.7 F1 26.2
 - ORG P 53.2 R 67.1 F1 59.3

- Ontologies create **shared meaning** and are a cornerstone of the **Semantic Web**
- **Manual construction** of ontologies is cumbersome and expensive
- **Ontology learning** is a (semi-)automatic process to assist the ontology engineer
- uComp builds on an existing ontology learning **framework**

- **Goal:** Apply the uComp HC framework to ontology learning and other ontology construction tasks
- **How:** A plugin implemented for Protégé, a popular ontology engineering platform, using the uComp HC API to validate ontological entities

Knowledge Creation Lifecycle



Active Ontology | Entities | **Classes** | Object Properties | Data Properties

Class hierarchy (inferred)
Class hierarchy
Class hierarchy: energy

- Thing
 - carbon
 - climate
 - CO2 ≡ carbon
 - dioxide
 - drought
 - earth
 - emission
 - energy**
 - electricity
 - heat
 - heating
 - environment
 - evidence
 - flood
 - flooding
 - fracking

Annotations | Usage | **uComp Class Validation**

uComp Class Validation: energy

Concept to be validated: energy

Validate relevance for domain: Climate Change

Additional information for validators: You can use external resources.

Send to CrowdFlower Send to uComp-Quiz

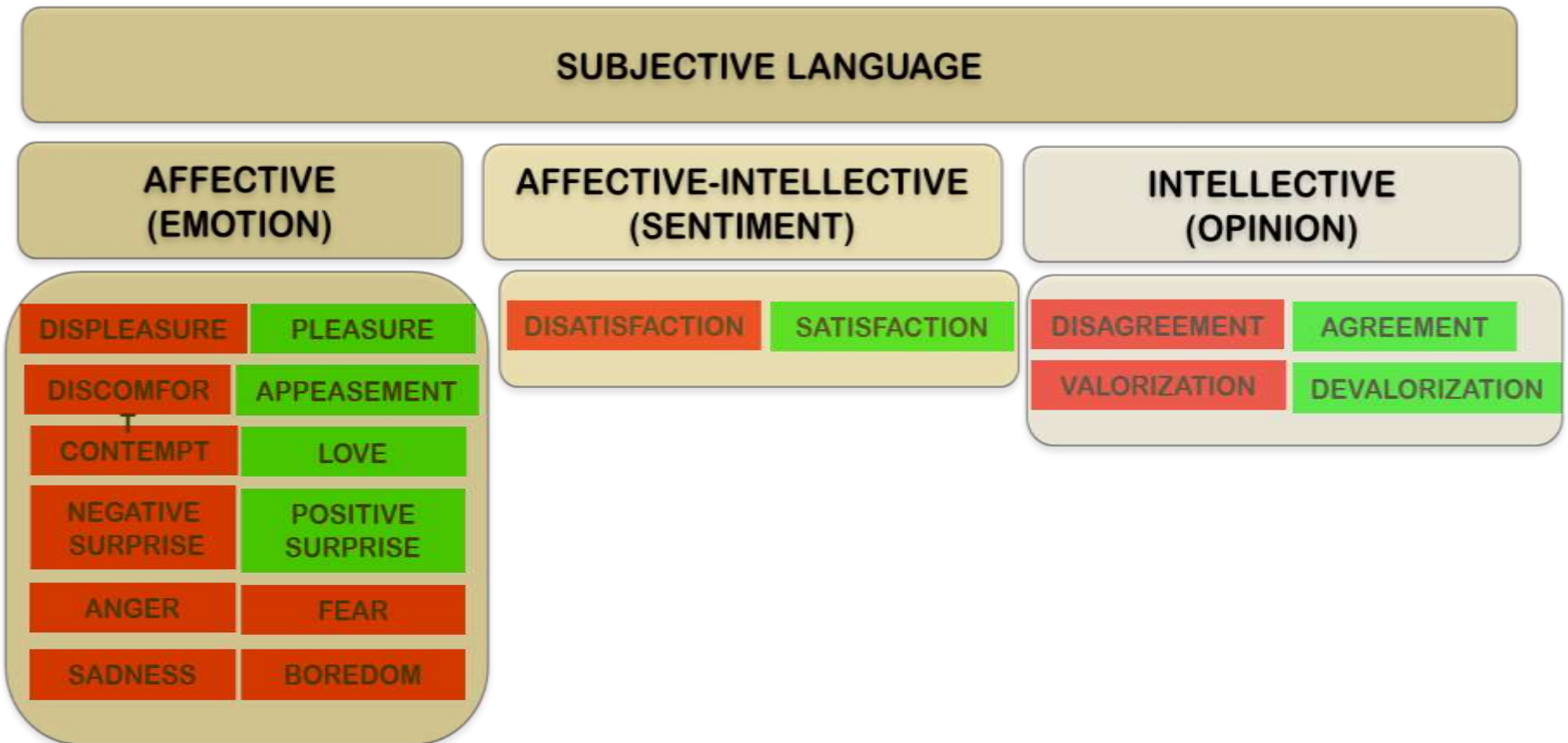
Validate subtree CALCULATE COSTS GO Cancel subtree CAN

This job contains **4 units**.
You have set the number of judgements to **5** and the amount of money paid per task to **3 cents** per task.
Expected total costs of this job are **\$0.60**.

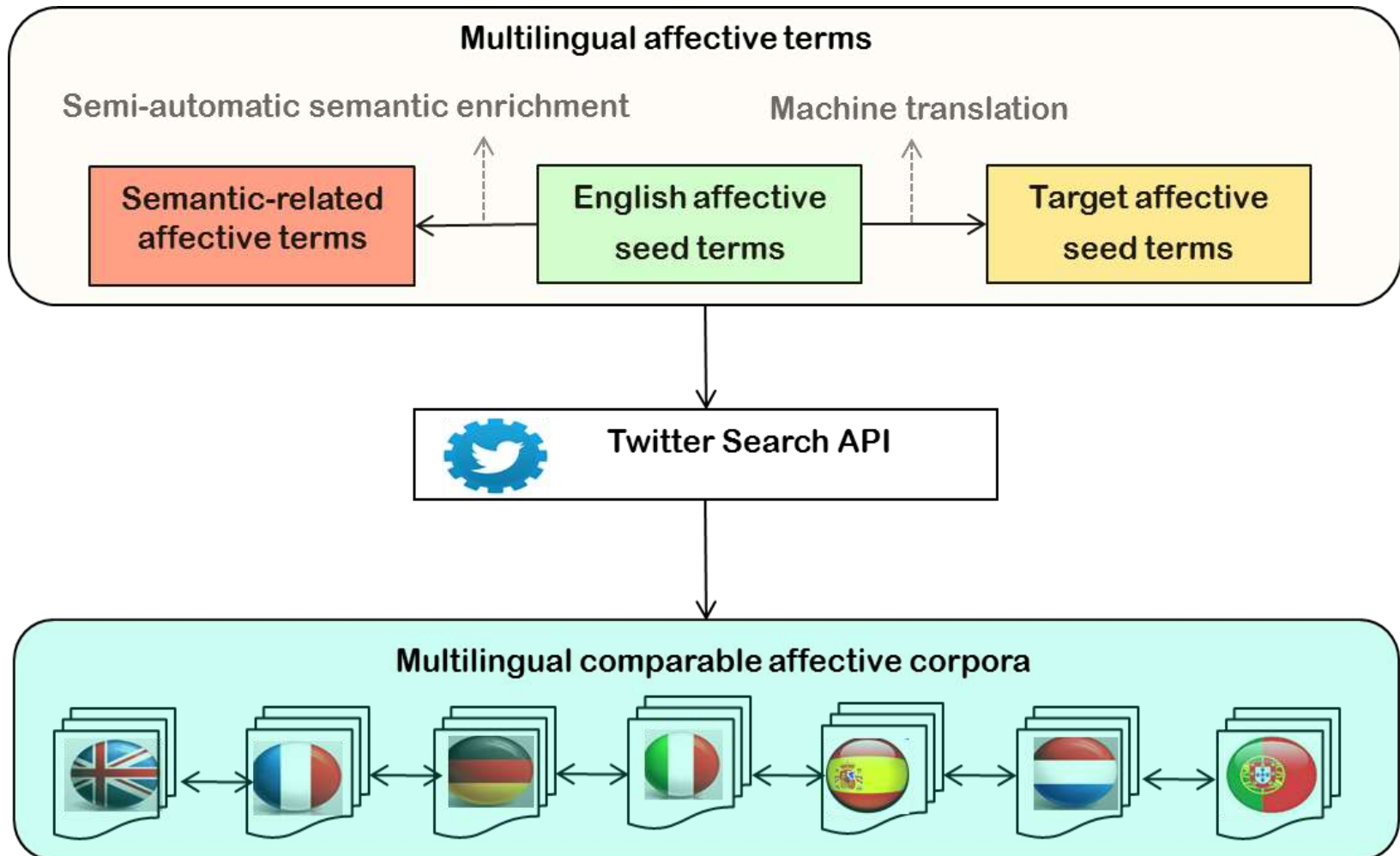
- **Feasibility Study**
 - **Cost:** Reduction of 40% to 83% depending on design used
 - **Quality:** Comparable with that of tasks performed by ontology engineers
- **Large-Scale Evaluation in Medical Domain**
 - **Result Quality:** Accuracy of 89% / 99%
 - **Completion Time:** Similar to domain experts
 - **Cost Reduction** of 75% to 81%

- Use HC to produce **affective resources** that are difficult to obtain automatically and too costly to produce manually, for multiple languages (**EN, FR, DE**).
- Assess HC-produced resources by evaluating the performance impact of using them instead of traditional resources for opinion mining and sentiment analysis (**quantitative black-box methodology**).
- Assess the possibility to replace static **gold standard resources** by dynamic HC

Affective Model

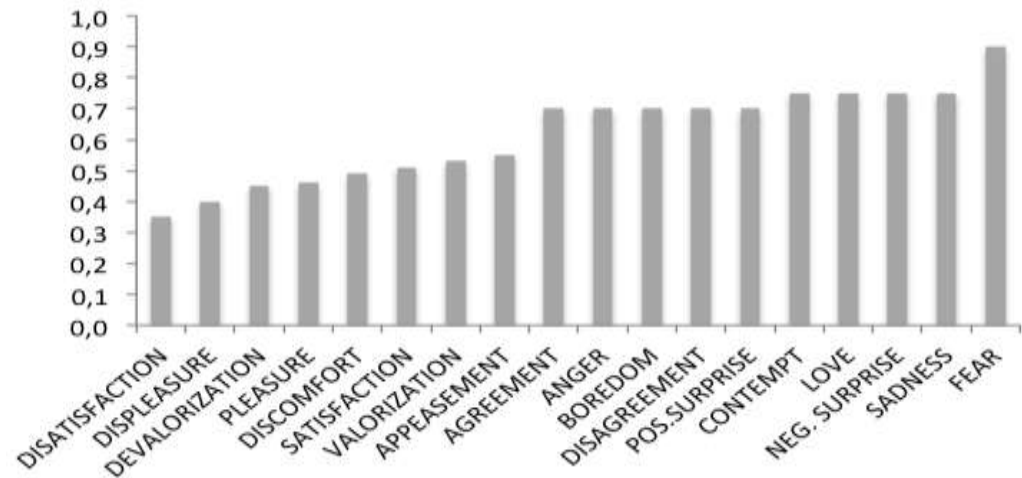


Multilingual Twitter Data



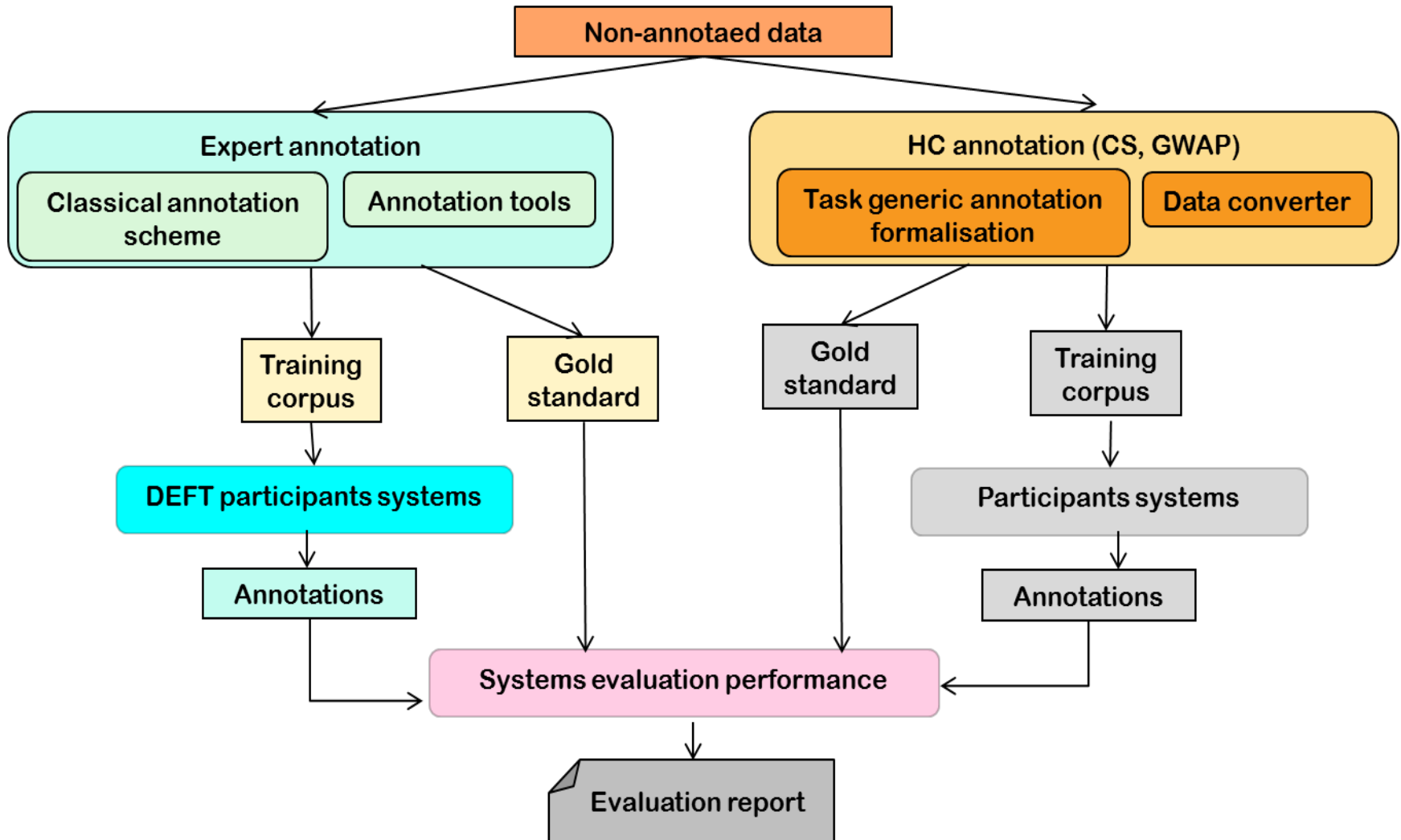
Crowdsourcing lexicon validation experiment

- French Affective Lexicon (9,939 Entries)
- Task Design
- Results
 - Feasibility depends on workers' motivation
 - Good quality/cost ratio
 - Ethical and legal issues



Percentage of crowdsourced validated terms per affective class

Evaluation



- **Data Annotation**
 - Expert Annotation: 30.000 tweets : 50% French + 50% German; French: Complete, German: In Progress
 - Annotation Guide
 - 7 Entities: Opinion Holder, Opinion Target, Opinion / Sentiment / Emotion Expression, Negation, Modifier, Global OSE Recipient
 - 6 Relations: SAYS, ABOUT, NEG, MOD and RECEIVER
- **Evaluation Campaign – DEFT2015**
 - 22 participants registered
 - Polarity, emotion, and opinion holder/target detection
 - DEFT Workshop at TALN 2015

- **Web Site:** www.ucomp.eu; **Twitter Presence:** [@uCompEU](https://twitter.com/uCompEU)
- **Deliverables: 17**
 - **Y1:** D1.1, D1.2, D2.1, D3.1, D5.1, D6.1, D6.2, D7.1, D7.2, D7.3
 - **Y2:** D1.3, D3.2, D3.4, D4.2, D5.2, D5.3, D7.4
- **Scientific Publications: 24**
- **Open-Source Toolkits: 4**
 - eWRT, TwitIE, Gate HC Plugin, Protégé Plugin
- **Collaboration:** DecarboNet (Climate Challenge), PHEME (Evaluation), Member of the European Center for Social Media
- **Training and Teaching**
 - Two week-long courses on Mining and Crowdsourcing Social Media Corpora. **GATE Summer School** (8-12 June 2015; 9-13 June 2014)
 - Tutorial: Knowledge Extraction from Social Media with GATE. 12th Extended Semantic Web Conference (**ESWC-2015**)
 - Tutorial: NLP for Social Media. 14th Conference of the European Chapter of the Association for Computational Linguistics (**EACL-2014**)

- **Project duration extended by six months until 14 May 2016 (key staff leaving at MOD and USFD; recruitment delays at WU)**
- **Changes to Work Plan**
 - D2.2 - Postpone to M30 (matching completion of T2.3 and T2.4);
 - D2.3 - Postpone to M40 (matching T2.5);
 - D3.3 - Postpone to M42 (matching completion of T3.4);
 - D5.2 v2 and D5.3 v.2 - postpone to M36 (to allow prior completion of D2.2. at M30);
 - D5.4 - Postpone to M42;
 - D6.3 - Postpone to M42 (as this needs to report on all the work done until the end of the project).