

An Overview of NLP Crowdsourcing Systems

Sixth ENeL Action meeting in Budapest
25 Feb 2017

Federico Sangati

Terminology

Crowdsourcing

Outsourcing

Citizen Science

Wisdom of the crowd

Human Computation

Amazon Mechanical Turk

Collective Intelligence

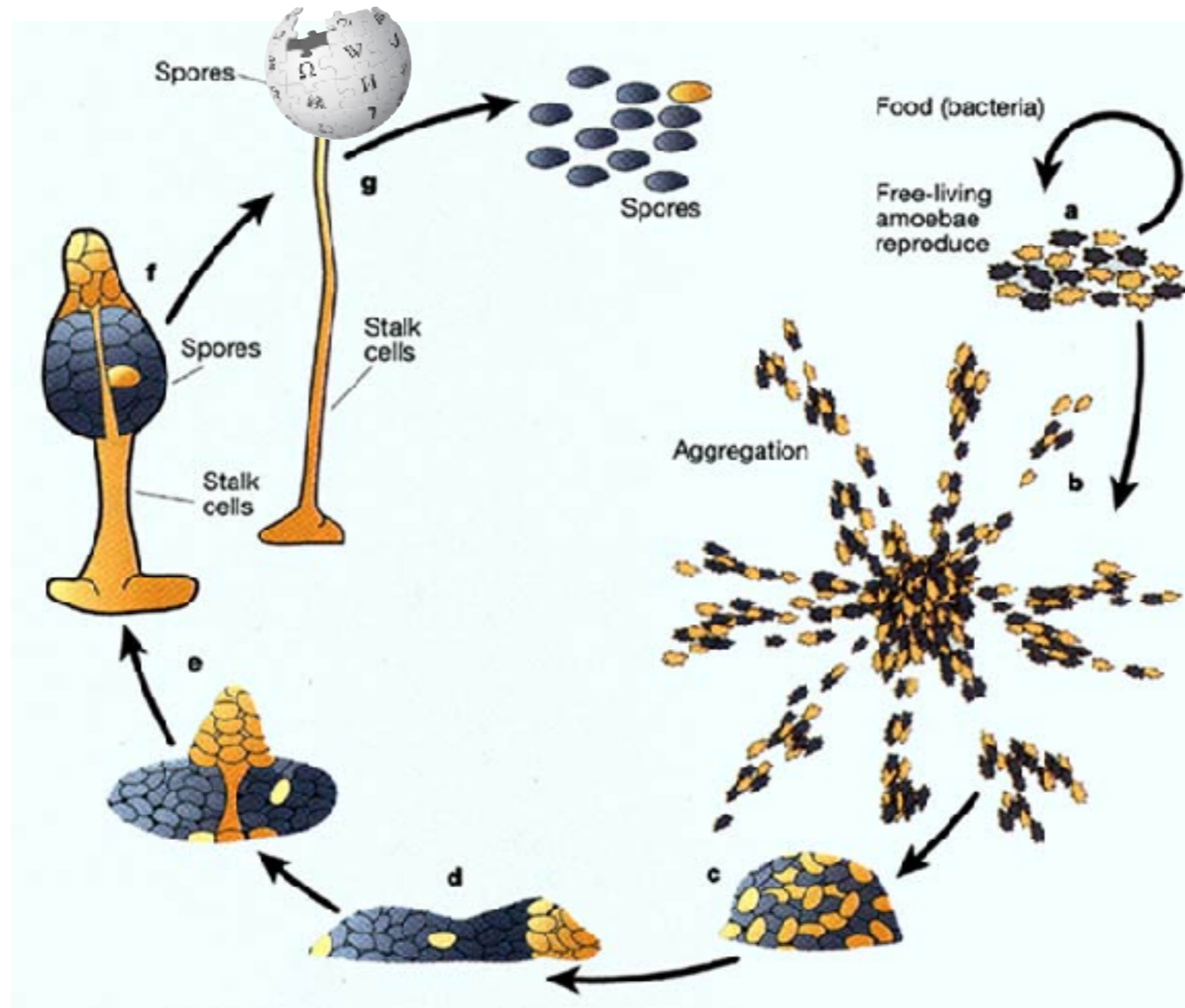
Game With a Purpose (GWAP)

Serious Games

Collaboratively Constructed Language Resources (CCLR)

Higher level of organization

Slime Mold



WIKIPEDIA (2001)

English

The Free Encyclopedia

3 907 000+ articles

日本語

フリー百科事典

799 000+ 記事

Español

La enciclopedia libre

879 000+ artículos

Русский

Свободная энциклопедия

838 000+ статей

Italiano

L'enciclopedia libera

905 000+ voci



Deutsch

Die freie Enzyklopädie

1 383 000+ Artikel

Français

L'encyclopédie libre

1 230 000+ articles

Polski

Wolna encyklopedia

887 000+ haseł

Português

A enciclopédia livre

718 000+ artigos

中文

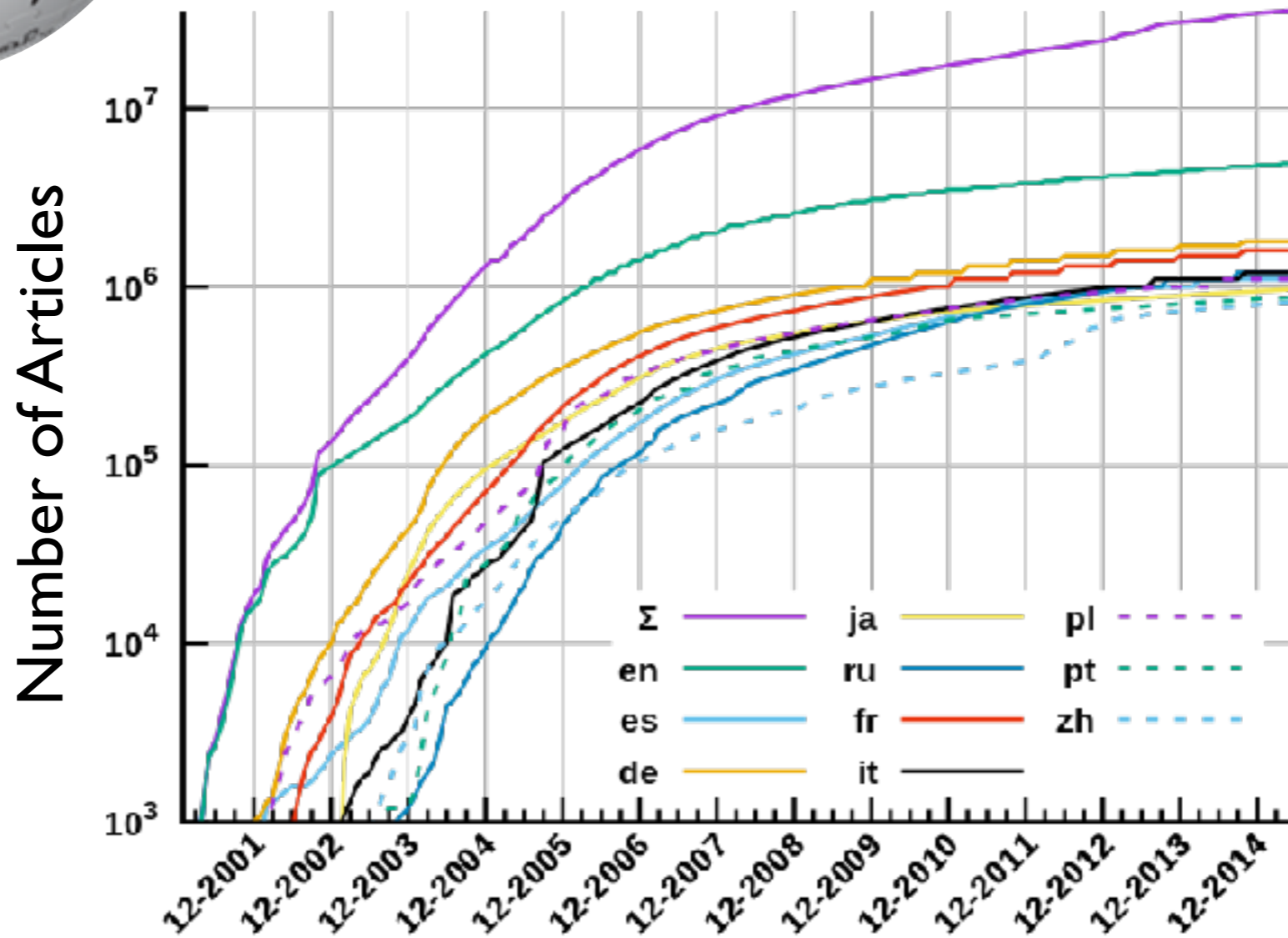
自由的百科全書

429 000+ 條目

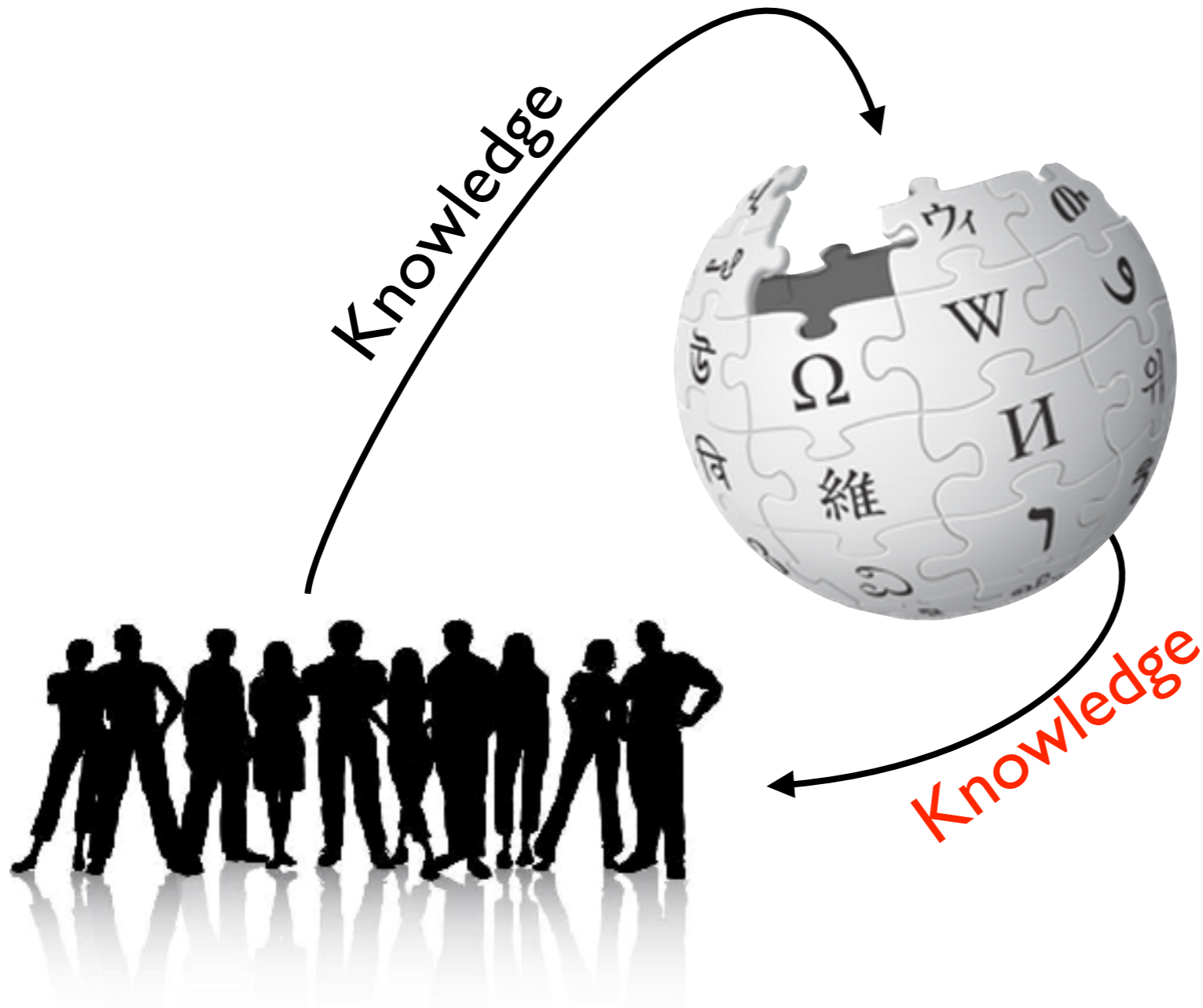


WIKIPEDIA

285 different languages



WIKIPEDIA



Amazon Mechanical Turk (2005)



Make Money by working on HITs

HITs - *Human Intelligence Tasks* - are individual tasks that you work on. [Find HITs now.](#)

As a Mechanical Turk Worker you:

- Can work from home
- Choose your own work hours
- Get paid for doing good work



Get Results from Mechanical Turk Workers

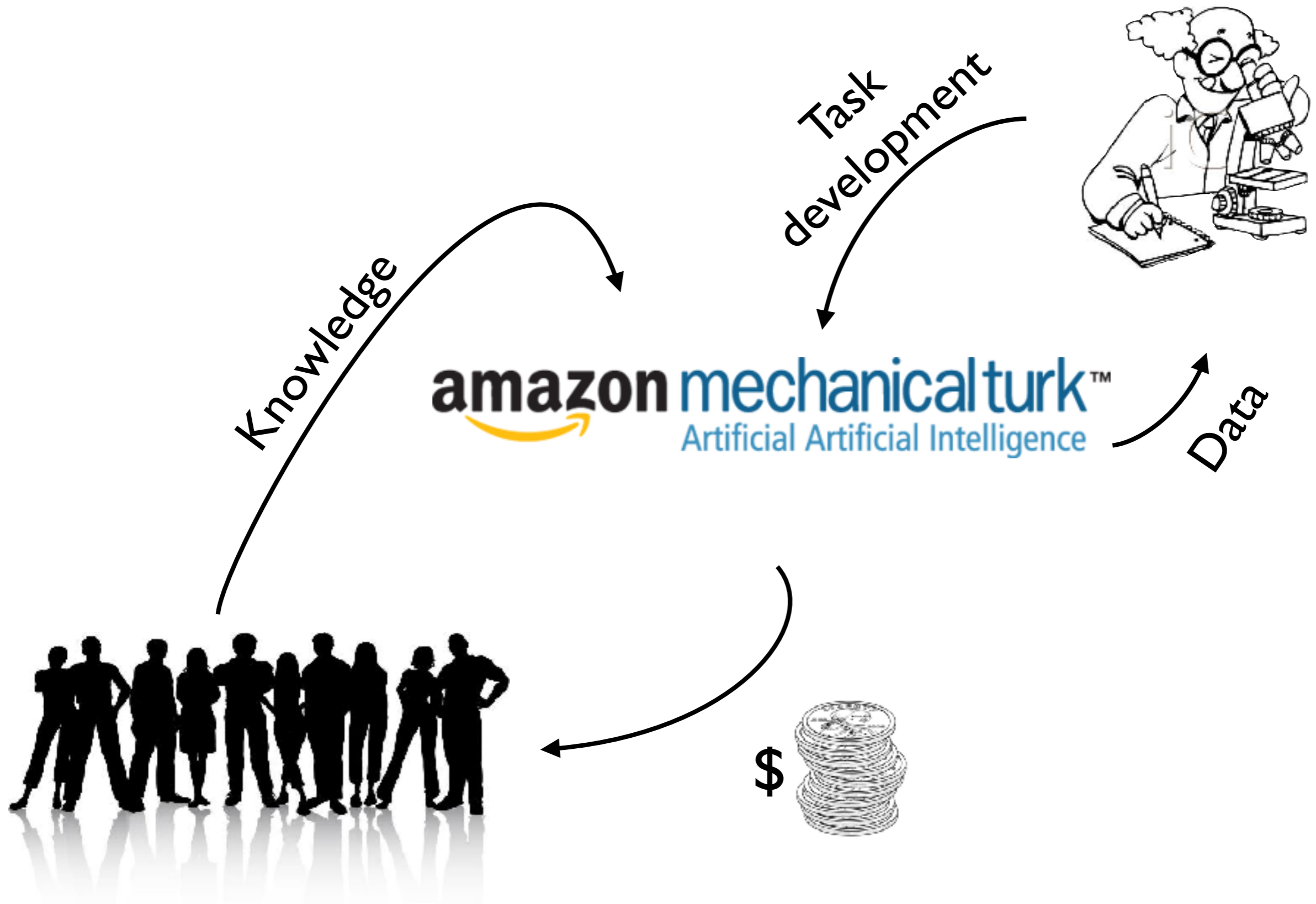
Ask workers to complete HITs - *Human Intelligence Tasks* - and get results using Mechanical Turk. [Get Started.](#)

As a Mechanical Turk Requester you:

- Have access to a global, on-demand, 24 x 7 workforce
- Get thousands of HITs completed in minutes
- Pay only when you're satisfied with the results



Amazon Mechanical Turk (2005)





amazon mechanicalturk™
Artificial Artificial Intelligence



ESP Game

Luis von Ahn (2004)



The ESP Game

2:05
Time Left

The ESP Game

0090
score



Taboo Words
USO
BANNER
PEOPLE

Your Guesses
CROWD
STAR
STARS
BLUE
WHITE
BLACK

Type your next guess:

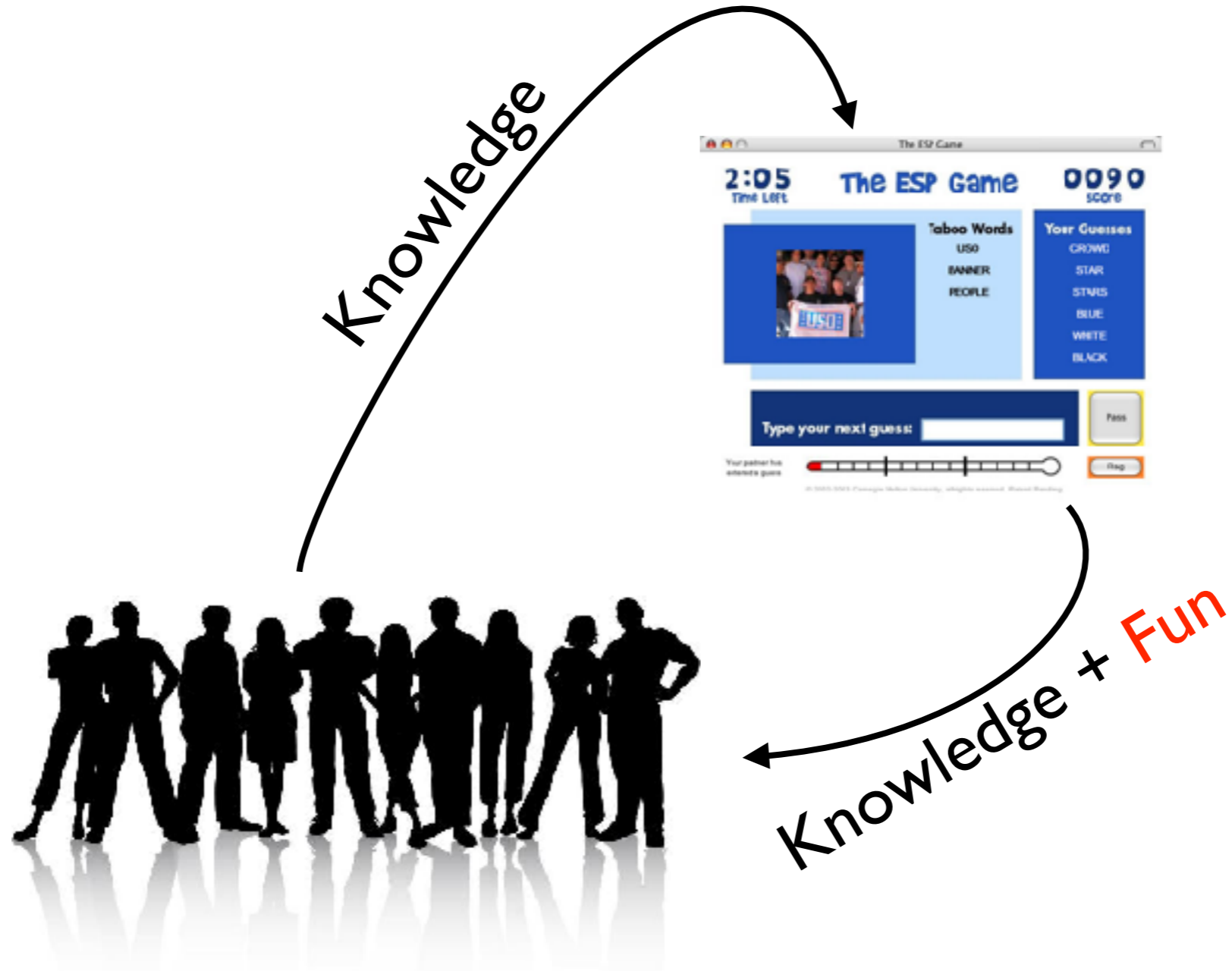
Pass

Flag

Your partner has entered a guess

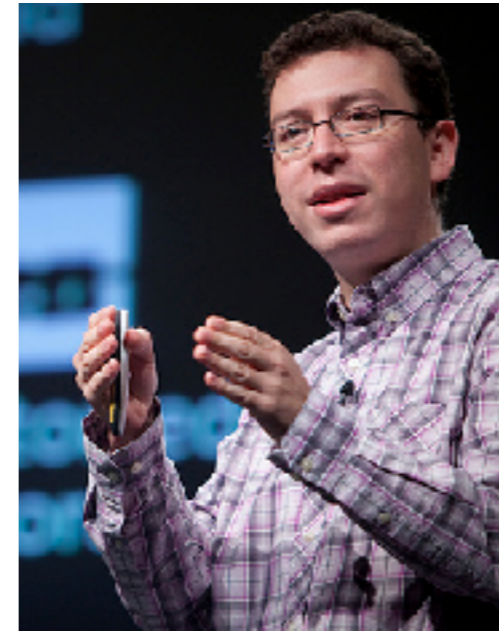
© 2002-2003 Carnegie Mellon University, all rights reserved. Patent Pending.

GWAP



reCAPTCHA

Luis von Ahn (2008)



The Norwich line steamboat train, from New-London for Boston, this **morning** ran off the track seven miles north of New-London.

morning

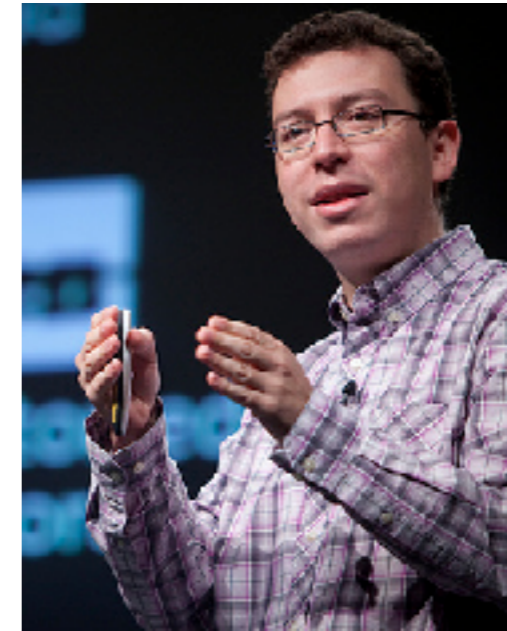
morning overtook

Type the two words:



Duolingo

Luis von Ahn (2012)



Edutainment



ZOONIVERSE

REAL SCIENCE ONLINE

CITIZEN SCIENCE  ALLIANCE

(2007)



Nature



Arts



Climate



Biology



History



Social Science



Space



Physics



Medicine



Literature



Language

ZOONIVERSE

REAL SCIENCE ONLINE

CITIZEN SCIENCE  ALLIANCE



Literature



SHAKESPEARE'S WORLD



MEASURING THE ANZACS



SCIENCE GOSSIP



OPERATION WAR DIARY

Why crowdsourcing in NLP

- Offset the high costs of language resource development and maintenance
- Seeking expertise outside the members of the project
- Create a public interest on linguistic research and synergies outside the academic environment (e.g., schools, elderly care taking infrastructures)

Main obstacles

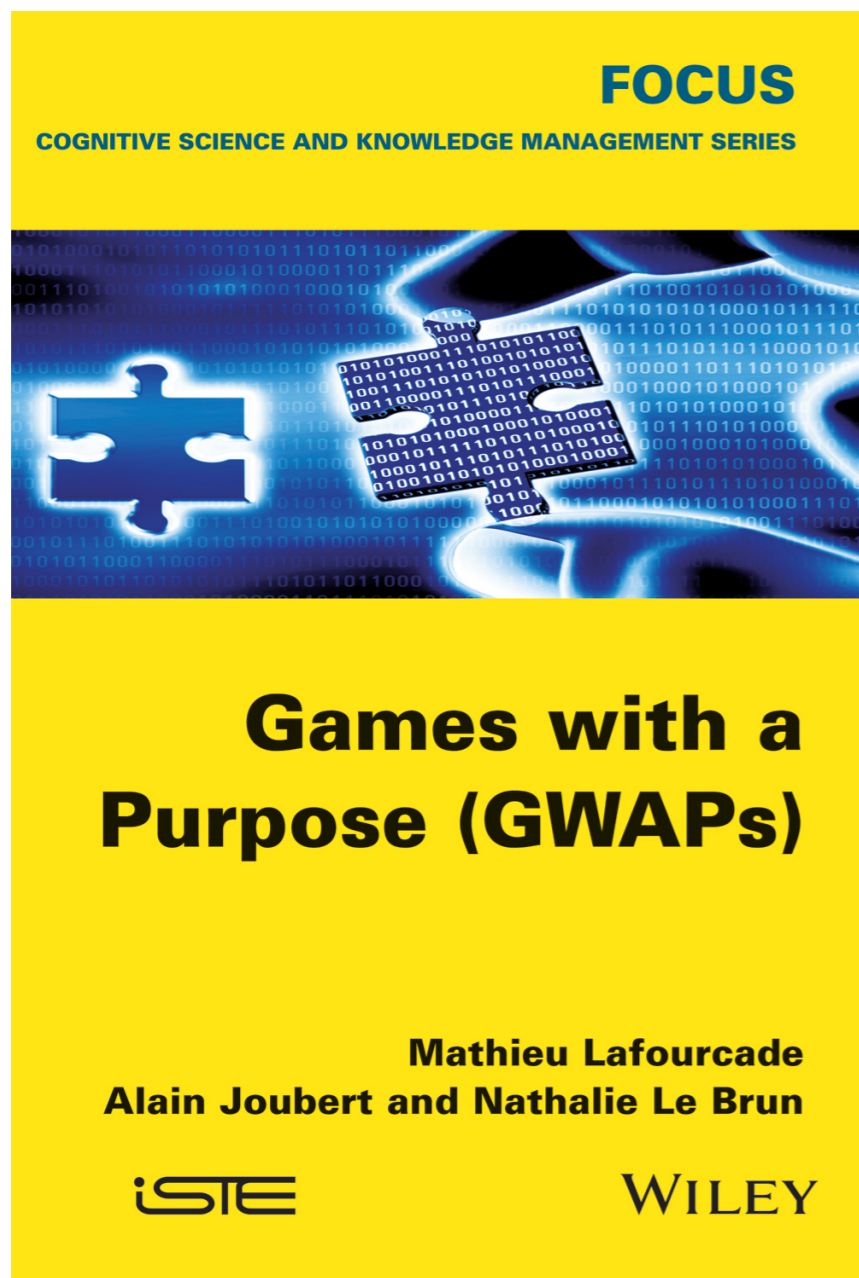
- Implementation: hard to program a successful system (paradigm, UX, robustness, scalability)
- Visibility: need to reach a critical mass of users in order for the project to succeed
- Dropouts: many people try the system just once and then abandon the project

Ingredients for success

- Implementation: Start simple and focus on game mechanics. Prototype the idea and test it with a small set of users before investing on interface and the rest.
- Visibility: enhance visibility of the project (social media) in order to attract new users.
- Dropouts: keep the community motivated and engaged.

GWAP Survey

- Mid January 2017: opened a survey on Corpora List of NLP-related Crowdsourcing Systems
- Selected answers at **tiny.cc/nlpcrowd**
- Survey is still open at tiny.cc/nlpcrowd_form



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📖 M. Lafourcade, A. Joubert, and N. Brun. Games with a Purpose (GWAPS). Focus Series in Cognitive Science and Knowledge Management. Wiley, 2015.

Name	Active	Topic	Launched
Open mind word expert	✗	Word Sense Tagging	2002
1001 Paraphrases	✗	Paraphrases	2005
Verbosity	✗	Word Common Sense Knowledge	2005
Jeuxdemots	✓	Lexico-Semantic Network	2007
Free Association / Categorilla / Categodzilla	✗	Word Associations	2008
OntoGames	✗	Word Ontologies	2008
Phrase Detective	✓	Anaphora Resolution	2008
Sentiment Quiz	✗	Sentence Sentiment Polarity	2009
PlayCoref	✓	Anaphora Resolution	2009
PhraTris	✗	Annotation of Syntactic Relations	2010
DuoLingo	✓	Foreign Language Learning	2012
Wordrobe	✓	Tagging (Part of Speech, Named Entity)	2012
Xtribe	✓	Writing Stories Collaboratively	2013
SmallWordlOfWords	✓	Collections of Words Associations	2013
ZombiLingo	✓	Annotation of Syntactic Relations	2014
Puzzle Racer Ka-boom!	✗	Concept to Picture Association	2014
Infection The Knowledge Towers	✗	Word Similarity, Antonymy, and Relations	2014
Clozemaster	✓	Language Learning	2014 (?)
Zoouniverse	✓	Literature Digitization and Tagging	2015 (?)
Bisame	✓	Part of Speech Tagging	2015 (?)
EmojiWorldBot	✓	Word Emoji Multilingual Dictionary	2016
Ingra-besed	✓	Word Collocations	2016

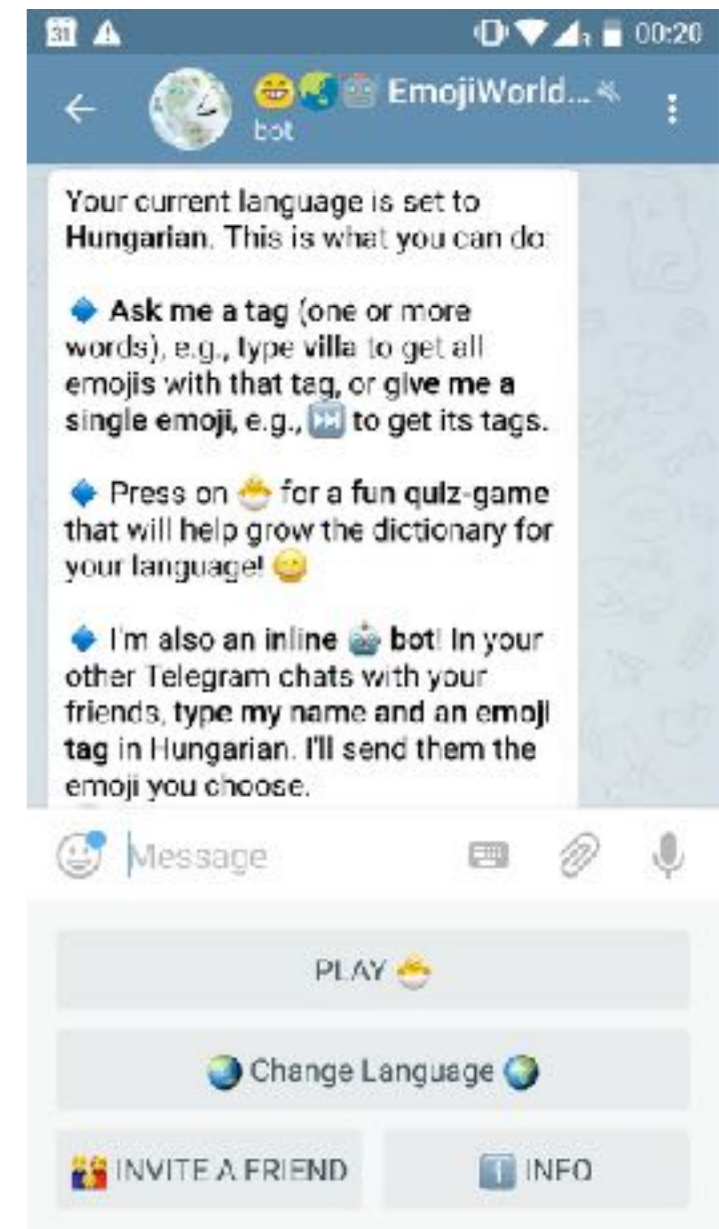
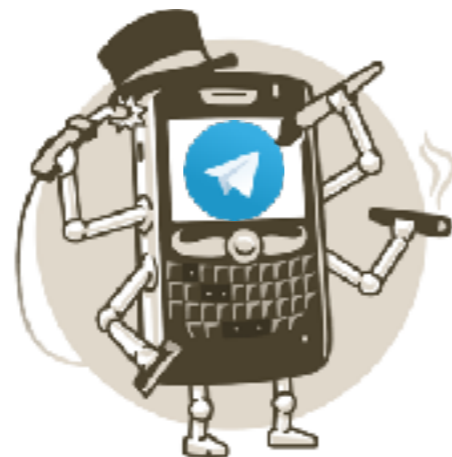


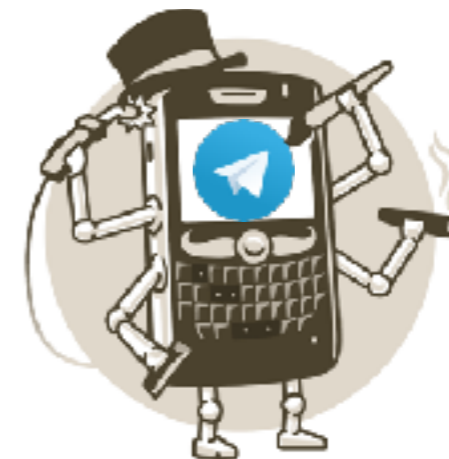
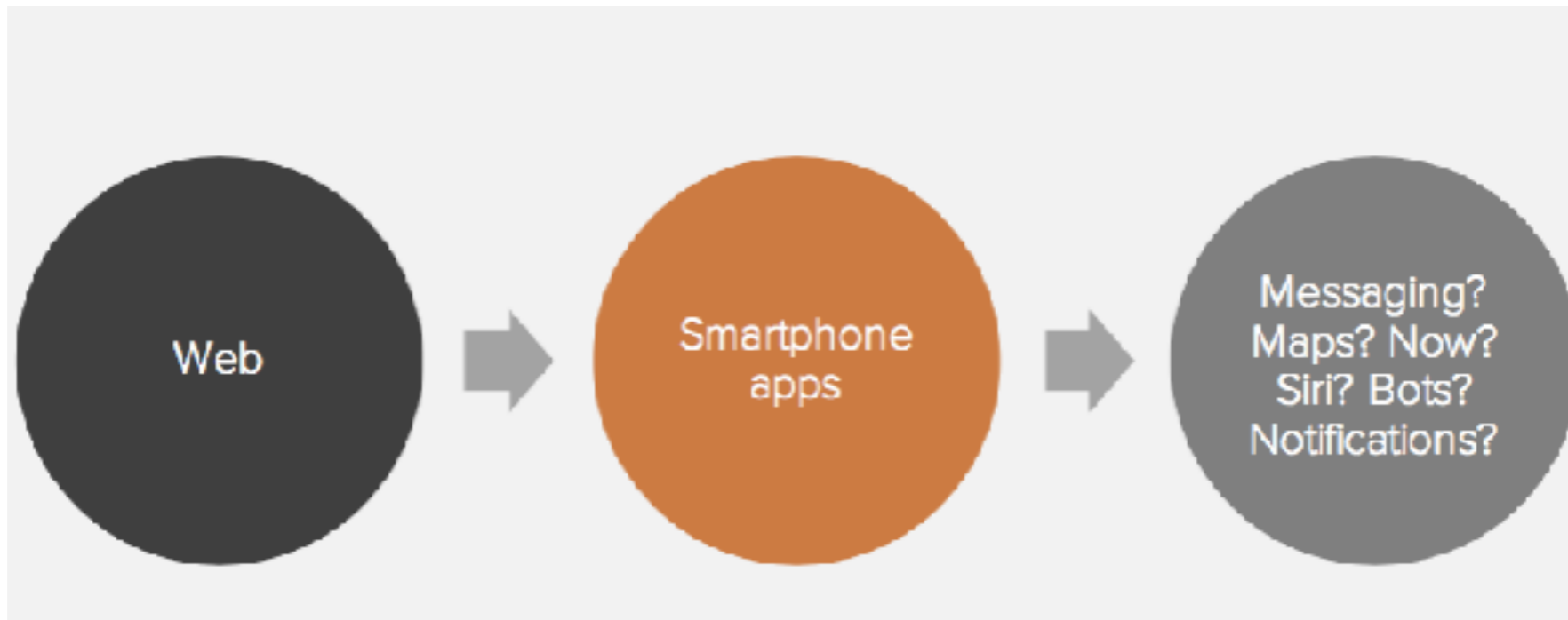
EmojiWorldBot



Martin Benjamin, École polytechnique fédérale Lausanne, Switzerland
Francesca Chiusaroli, Macerata University, Italy
Johanna Monti, Napoli University, Italy

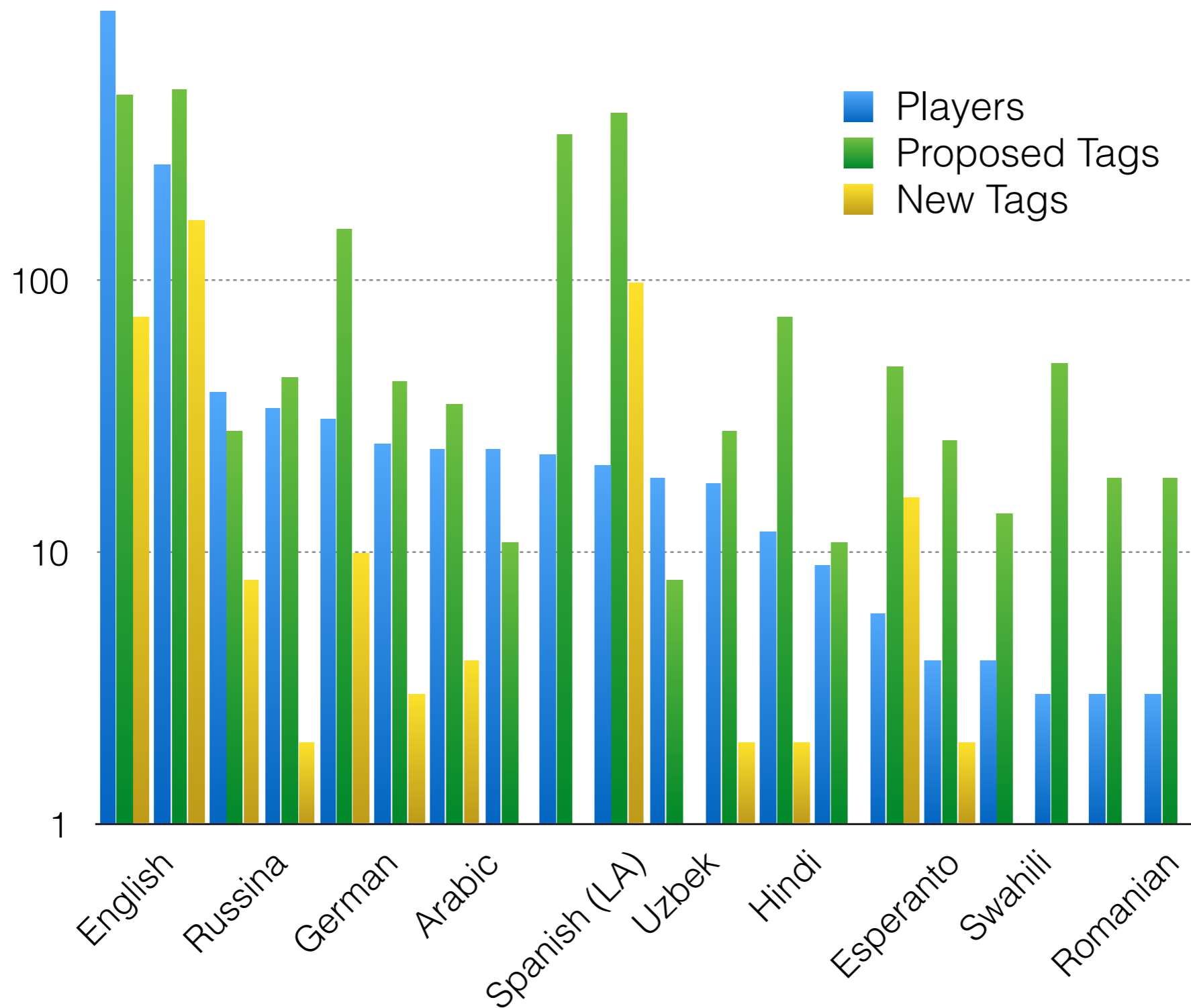
- Emoji ↔ Text in 130 different languages (and growing)
- Implemented as a chat-bot in the Telegram messaging platform





Collected Annotations (since Sept. 2016)

- 61 languages with at least one annotation
- ~1700 players, ~2500 proposed tags, ~500 new tags in total



Final Remarks

- Get inspired by non-NLP crowdsourcing systems.
- Create single platform for NLP based crowdsourcing projects (boost visibility, code sharing)?
- Seek synergies with other types of institutions (e.g., school, elderly care taking infrastructures).
- New platforms chat-bots platforms.

SCHOOL-TAGGING



Classroom Exercises for Language Research

Web platform for **collaborative language exercises** in classrooms with the help of the **teacher**.

School Classrooms



Computational Linguistics Research

Exercises result will be used to **create linguistic resources**.



<http://dh.fbk.eu>

https://twitter.com/DH_FBK

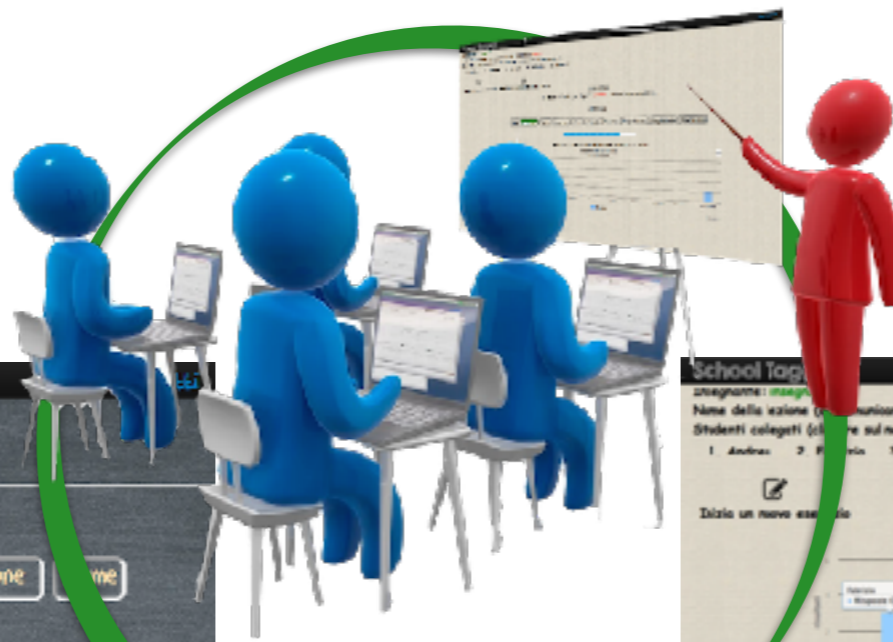
SCHOOL-TAGGING



Classroom Exercises for Language Research

Students engage in game-like exercises with immediate feedback.

Teachers can monitor individual and aggregated answers in real time and validate results.



School Tagging
 Studente: Fabrizio
 Nome della lezione: lezione

Il padre di Paolo, un signore **anziano**, mostra ancora baldanza.


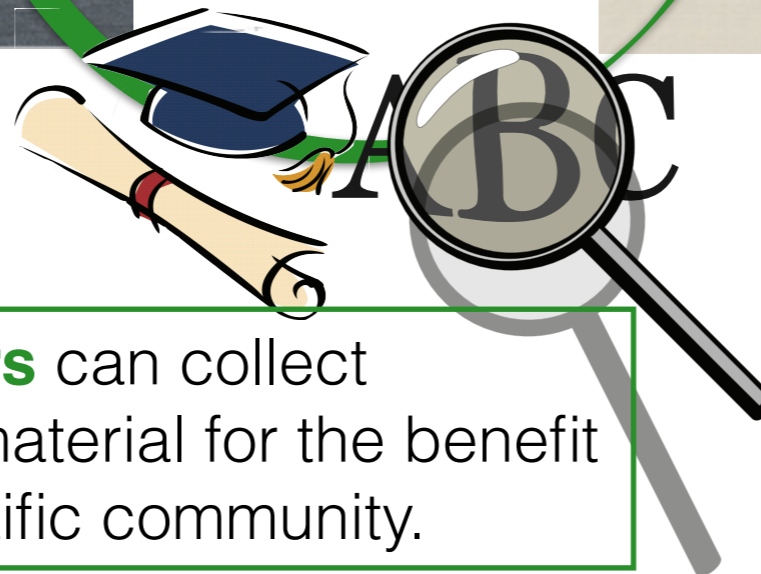
Preposizione Interiezione Altro **Aggettivo** verbo Pronome Congiunzione
 Articolo Avverbio

Attendi la validazione dell'insegnante

School Tagging
 Insegnante: **tagging**
 Nome della lezione (comunicare agli studenti): **lezione**
 Studenti collegati (cliccare sul nome per visualizzare le statistiche):
 1. Andrea 2. Paolo 3. Barbara 4. Vittorio 5. Giovanni

Titolo un nuovo esercizio

Risposta della Classe
 (risposta studenti)

Researchers can collect annotated material for the benefit of the scientific community.

