

EUROPEAN LANGUAGE GRID

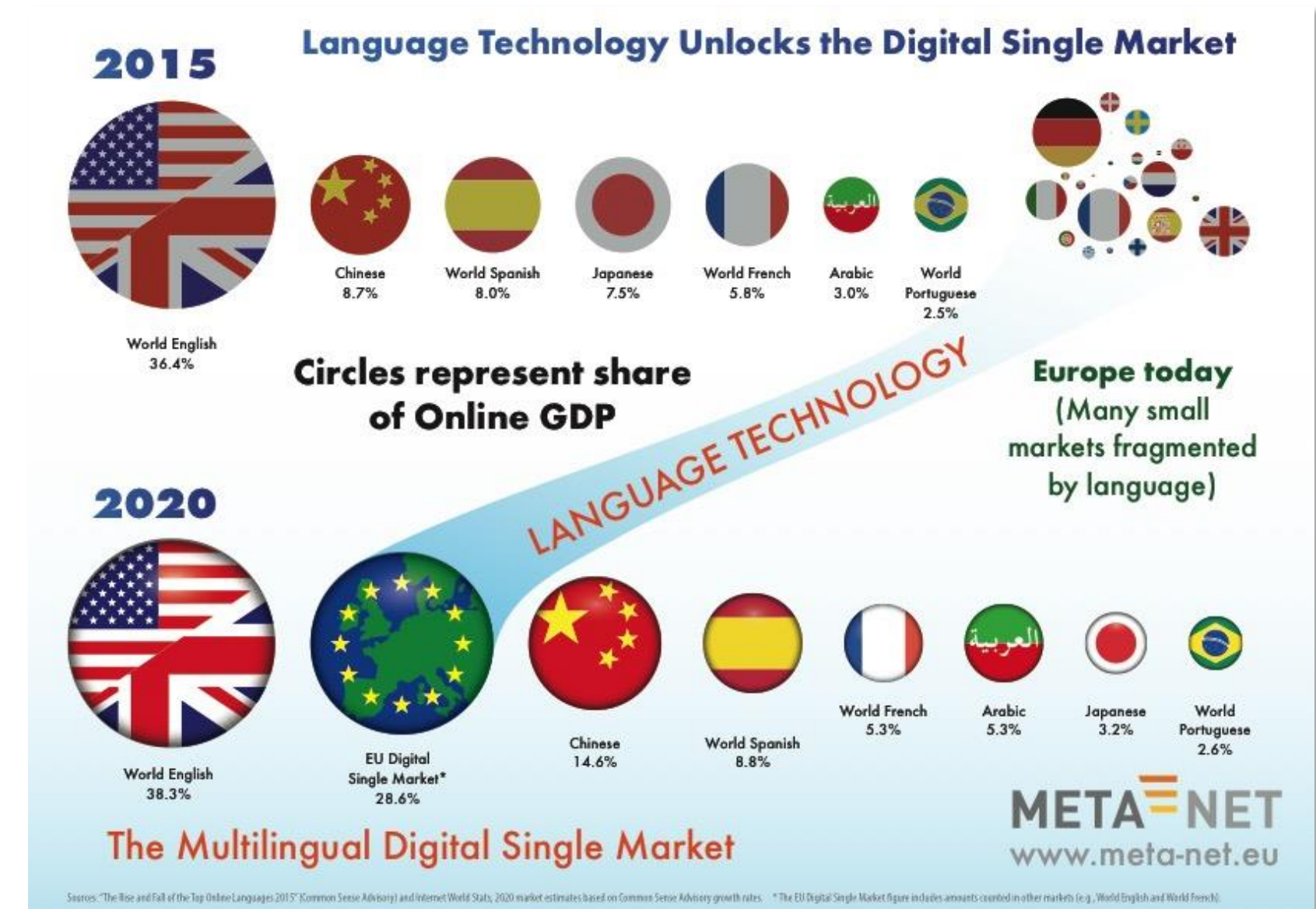
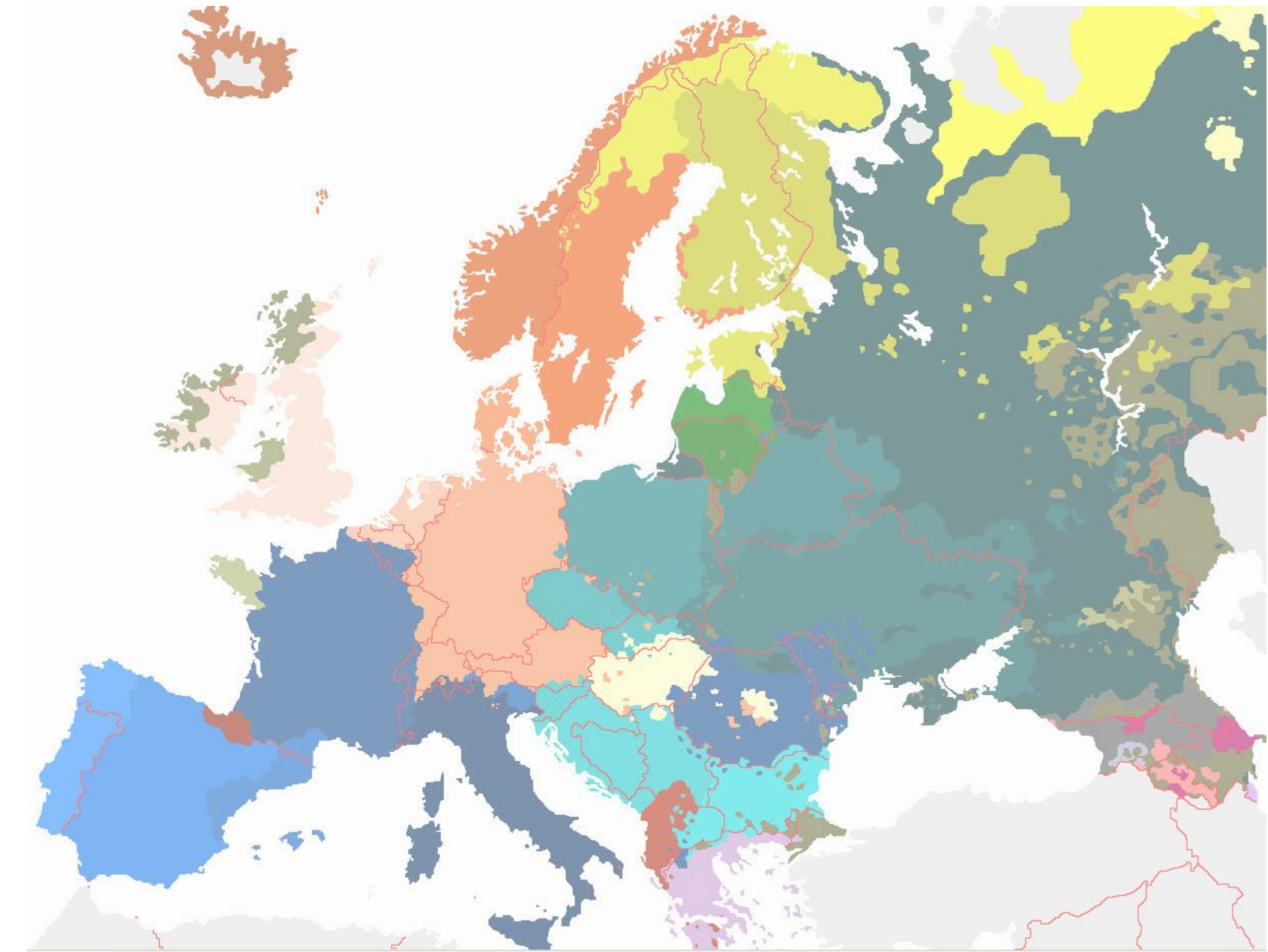
The European Language Grid and European Language Equality Projects

Penny Labropoulou, Athena RC/ILSP
27-05-2022 ELG NCC Workshop Slovenia

<http://www.european-language-grid.eu>
<http://www.european-language-equality.eu>

Multilingualism in Europe

- Multilingualism is at the heart of the European idea
- 24 EU languages – they all have the same status
- Dozens of regional and minority languages as well as languages of immigrants and trade partners
- Many economic, social and technical challenges:
 - The Digital Single Market needs to be multilingual
 - Cross-border, cross-lingual, cross-cultural communication
 - Fragmentation of the LT market and landscape (including availability of LTs and LRs)





META FORUM 2010

T4ME

T4ME
EU-funded project (Seventh Framework Programme) working on technologies for the Multilingual European Information Society

META-NET

META-NET
Established in 2010, META-NET is a network of Excellence consisting of 60 research centres from 34 countries, building the technological foundations of a multilingual European information society

META-FORUM 2010
“Challenges for Multilingual Europe”
(November 17/18, 2010)



META SHARE

META FORUM 2012

META-FORUM 2012
Conference “A Strategy for Multilingual Europe”
(Brussels – June 20/21, 2012)

META-NET White Papers
Release of 32 volumes on 31 languages, revealing that there is a severe threat of digital extinction for at least 21 European languages
(December 2012)

META FORUM 2015



CRACKER
EU-funded project CRACKER (Horizon2020) pushing towards an improvement of MT research in terms of efficiency and effectiveness (2015 – 2017)

Cracking the Language Barrier Federation
Founded in 2015, the federation has been assembling European research and innovation projects as well as all related community organisations working on multilingual technologies

META-FORUM 2015
Conference “Technologies for the Multilingual Digital Single Market” (Riga – April 27, 2015)

Strategic Agenda for the Multilingual Digital Single Market (Version 0.5)
Launch of the Strategic Agenda for the Multilingual Digital Single Market titled “Technologies for Overcoming Language Barriers towards a truly integrated European Online Market” (April 2015)

Riga Summit on the Multilingual Digital Single Market
Summit “Shape the future of the multilingual digital single market” (April 27–29, 2015)

META FORUM 2017

META FORUM 2019

“Language Equality in the Digital Age”
Workshop on “Language Equality in the Digital Age”, commissioned by the EU Parliament’s Science and Technology Options Assessment Committee (STOA) (January 2017)

“Language equality in the digital age: Towards a Human Language Project”
Launch of the study on “Language equality in the digital age: Towards a Human Language Project”, commissioned by the EU Parliament (March 2017)

META-FORUM 2017
Conference “Towards a Human Language Project” (Brussels – November 13/14, 2017)

Strategic Research and Innovation Agenda (V1.0)
Launch of the Strategic Research and Innovation Agenda titled “Language Technologies for Multilingual Europe – Towards a Human Language Project” (December 2017)



EUROPEAN LANGUAGE EQUALITY

2021-2022

EUROPEAN LANGUAGE GRID

2019-2022

2010

2011

2013

2015

2017

2012

2014

2016

2018

META NORD

META-NORD
EU-funded (ICT PSP) Project to establish an open linguistic infrastructure in the Baltic and Nordic countries (2011 – 2013)

METANET4U

METANET4U
EU-funded project (ICT PSP) to enhance the European Linguistic Infrastructure (2011 – 2013)



CESAR
EU-funded project (ICT PSP) functioning as a part of META-NET to standardise language resources and tools (2011 – 2013)

META-FORUM 2011
Conference “Solutions for Multilingual Europe”
(Budapest – June 27/28, 2011)

META FORUM 2011

“State of the Art of Machine Translation – Current Challenges and Future Opportunities”
Workshop on “State of the Art of Machine Translation”, commissioned by the EU Parliament (December 2013)

META-SHARE
Initiated in 2013, META-SHARE has functioned as an open and secure network of repositories for sharing and exchanging language data, tools and services

Strategic Research Agenda for Multilingual Europe 2020
Launch of the Strategic Research Agenda for Multilingual Europe 2020 (January 2013)

META-FORUM 2013
Conference “Connecting Europe for New Horizons”
(Berlin –September 19/20, 2013)

META FORUM 2013

Strategic Research and Innovation Agenda (Version 0.9)
Launch of the Strategic Research and Innovation Agenda titled “Language as a Data Type and Key Challenge for Big Data” (July 2016)

META-FORUM 2016
Conference “Beyond Multilingual Europe”
(Lisbon – July 4/5, 2016)



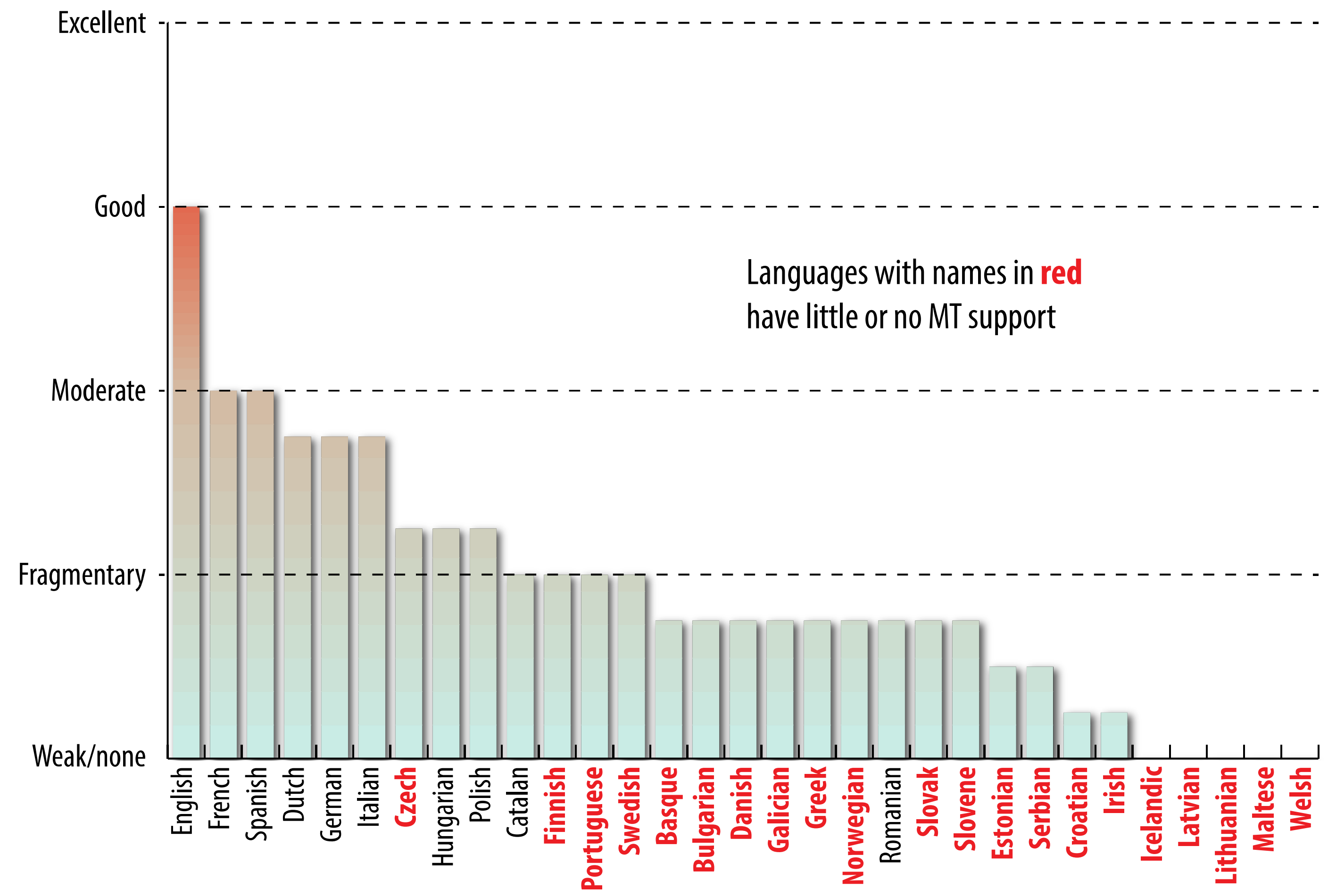
META FORUM 2016

ELG Final Proposal Submission
Final submission on Feb. 20, 2018





Level of support



“Language Equality” EP Resolution (2018)

EP Resolution “Language equality in the digital age”
P8_TA(2018)0332 – partially based on the STOA study

Voting (11 Sept. 2018): **592 yes** – 45 no

Recommendations addressed by European Language Grid:

29. Create a European LT platform for sharing of services

41. Enable and empower European SMEs to use LTs

26. ICT integrators should be given economic incentives for LT

27. Europe has to secure its leadership in language-centric AI

32. Set up LT financing platform; emphasise R&D in Deep NLU

40. Develop investment instruments and accelerator programs

European Parliament
2014-2019



TEXTS ADOPTED
Provisional edition

P8_TA-PROV(2018)0332

Language equality in the digital age

European Parliament resolution of 11 September 2018 on language equality in the digital age (2018/2028(INI))

The European Parliament,

- having regard to Articles 2 and 3(3) of the Treaty on the Functioning of the European Union (TFEU),
- having regard to Articles 21(1) and 22 of the Charter of Fundamental Rights of the European Union,
- having regard to the 2003 UNESCO Convention for the Safeguarding of the Intangible Cultural Heritage,
- having regard to Directive 2003/98/EC of the European Parliament and of the Council of 17 November 2003 on the re-use of public sector information¹,
- having regard to Directive 2013/37/EU of the European Parliament and of the Council of 26 June 2013 amending Directive 2003/98/EC on the re-use of public sector information²,
- having regard to Decision (EU) 2015/2240 of the European Parliament and of the Council of 25 November 2015 establishing a programme on interoperability solutions and common frameworks for European public administrations, businesses and citizens (ISA2 programme) as a means for modernising the public sector³,
- having regard to the Council resolution of 21 November 2008 on a European strategy for multilingualism (2008/C 320/01)⁴,
- having regard to the Council decision of 3 December 2013 establishing the specific programme implementing Horizon 2020 – the Framework Programme for Research and

¹ OJ L 345, 31.12.2003, p. 90.

² OJ L 175, 27.6.2013, p. 1.

³ OJ L 318, 4.12.2015, p. 1.

⁴ OJ C 320, 16.12.2008, p. 1.

European LT Market – CEF Study

Approach and Observations

- Background: SMART 2016/0103 contract: contribute to CEF AT as “multilingualism enabler” for CEF DSIs.
- European LT vendors grouped per type of tech: Translation, Speech, Search, NLU, Analytics
- **EU market approx. 1B€ in 2020 – disrupted by dominant global players**
- SMEs: 70% of EU LT vendors up to 50 employees
- Revenue per company is growing
- Market is highly fragmented: hundreds of SMEs, many address very specific niches, sectors and languages

- **CEF study estimated the European LT Market to reach 1B€ in 2020.**
- **Numbers obsolete, market is going through the roof – thanks to AI!**

Recommendations

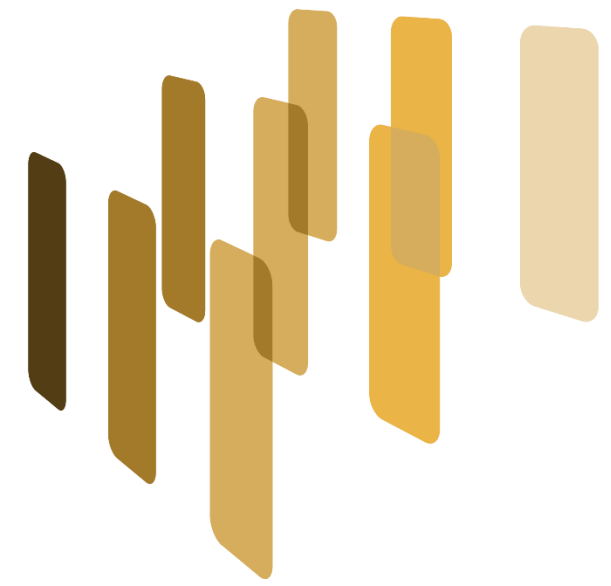
- Europe is strong in R&I, but not successful to scale innovations and capture the market
- Europe needs European alternatives to fill the gaps and deficiencies and to avoid reliance on monopolies
- Multilingual DSM should be developed on its own infrastructure
- Public procurement can be the major driver for European LT industry to avoid dependence on monopolies
- Plans needed to avoid brain drain
- *A platform is needed to connect demand and supply as well as industry and research*



The Global Natural Language Processing Market size is expected to reach \$29.5 billion by 2025, rising at a market growth of 20.5% CAGR during the forecast period

Globe Newswire | FOLLOW
January 14, 2020 4:26am | Comments

- **Truly incredible market forecast!**
(Source: Global Newswire)



EUROPEAN LANGUAGE GRID

Objectives (Selection)

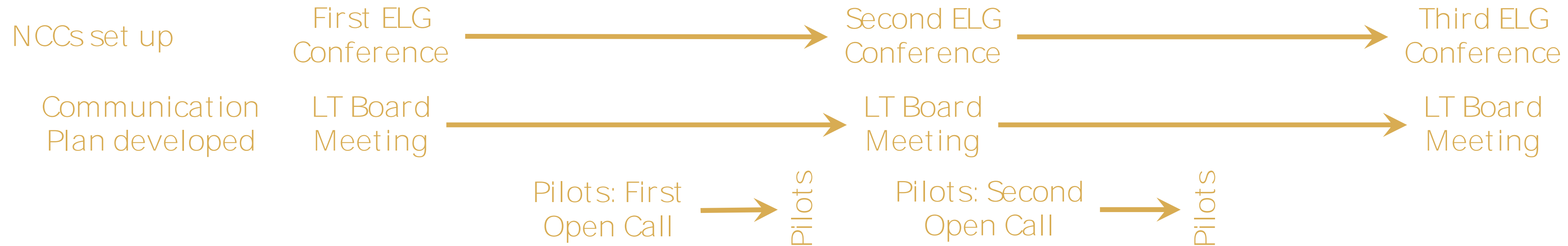
1. Establish the ELG as the primary Language Technology platform and market place in Europe to tackle the fragmentation of the European LT landscape.
2. ELG as a platform for commercial and non-commercial, industry-related LTs.
3. Enable the European LT community to upload services and data sets, to deploy them and to connect with, and make use of those resources made available by others.
4. Enable businesses to grow and benefit from scaling up.
5. Unleash enormous potential for innovation.



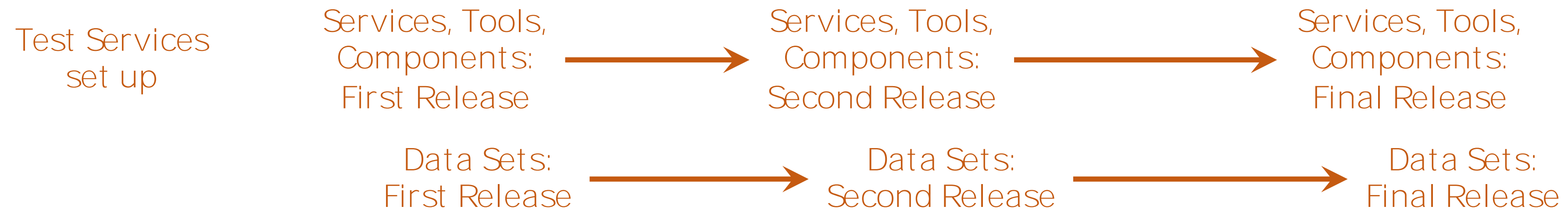
Kick-off meeting, 22/23 January 2019



Grid Community



Grid Content



M1



M12



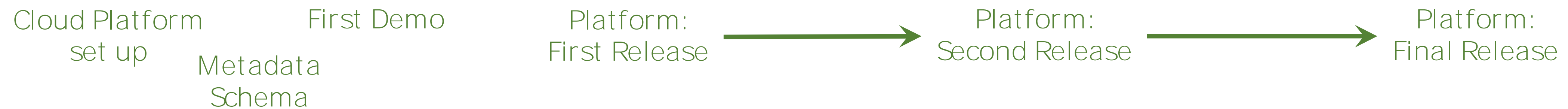
M24



M36

M42

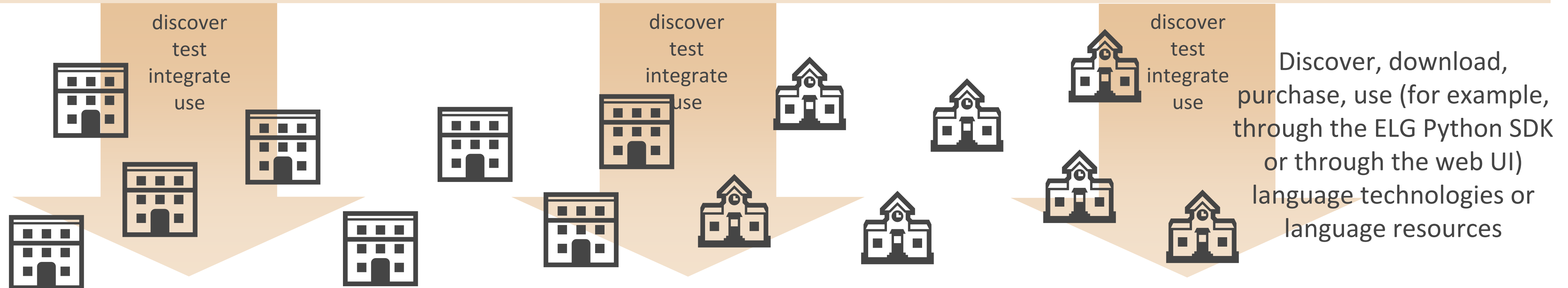
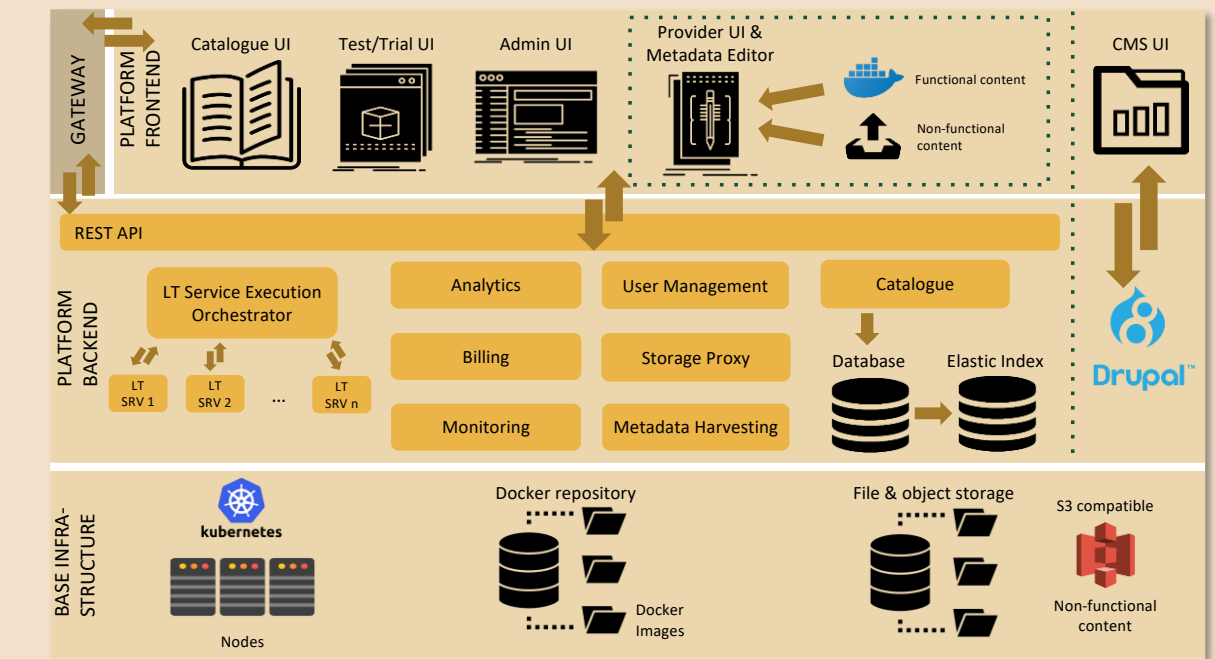
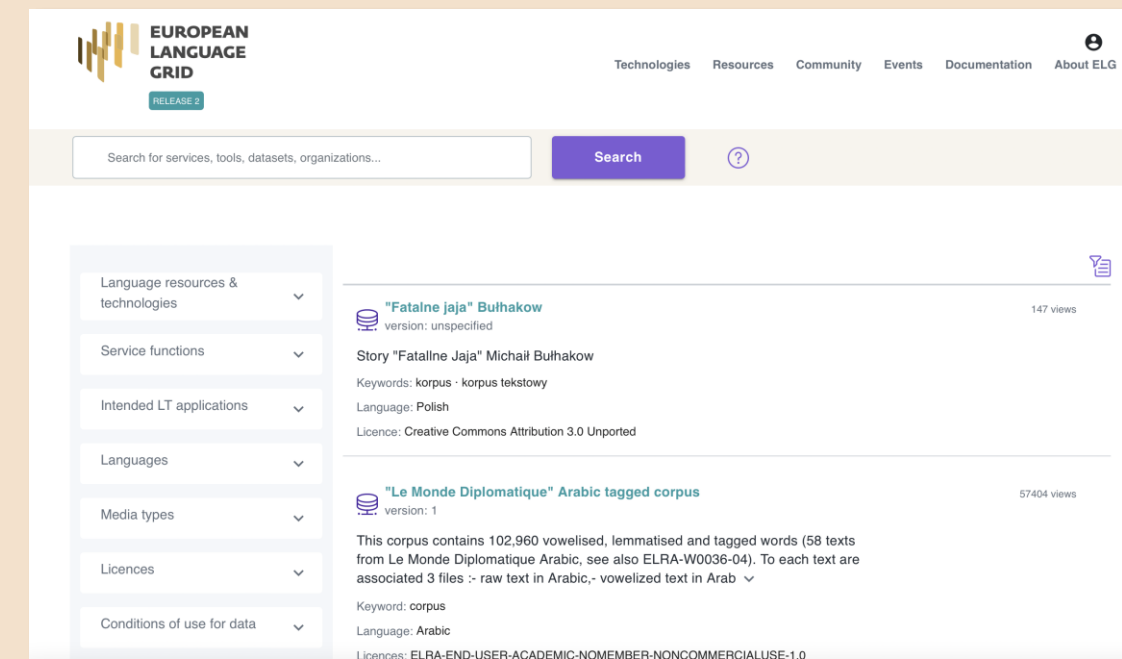
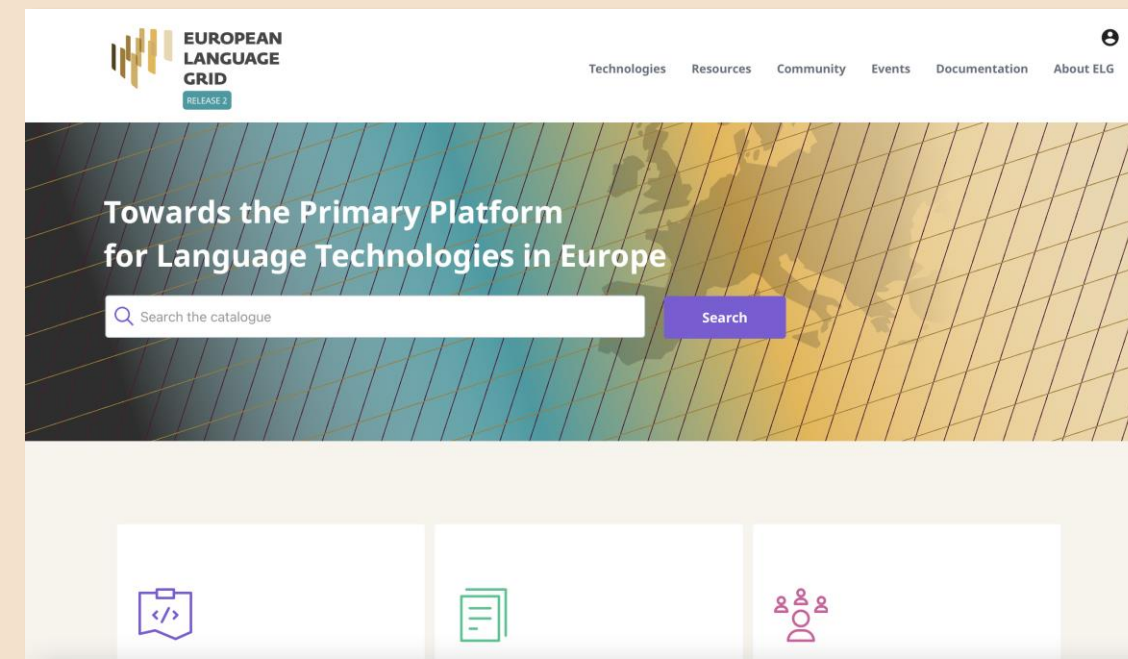
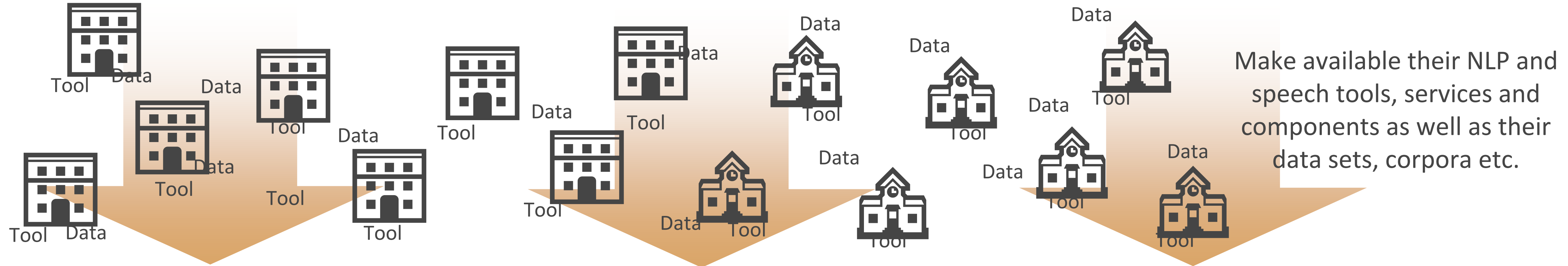
Grid Platform



Mgmt.



Developers of Language Technologies: Companies, Universities, Research Centres (approx. 1800 organisations in total)



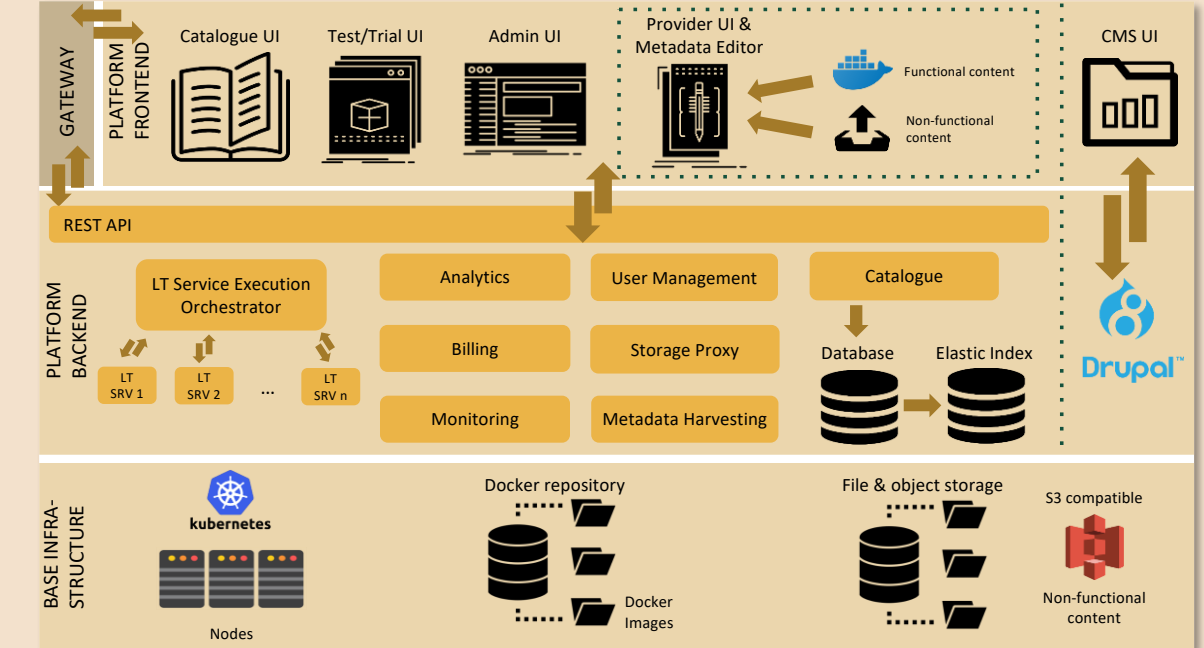
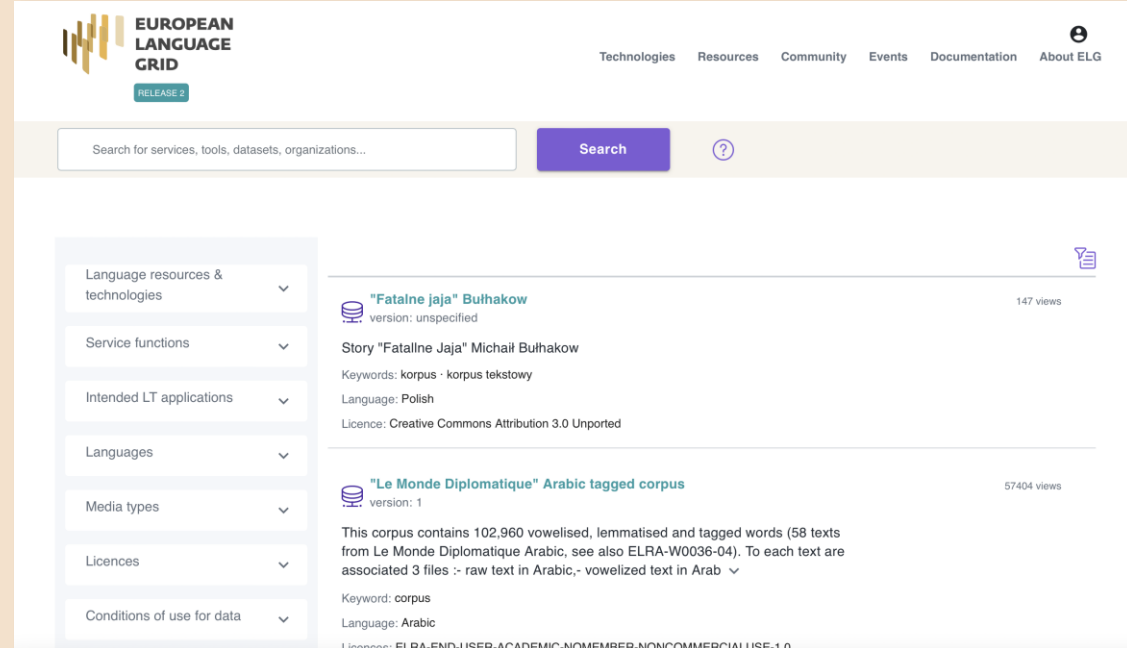
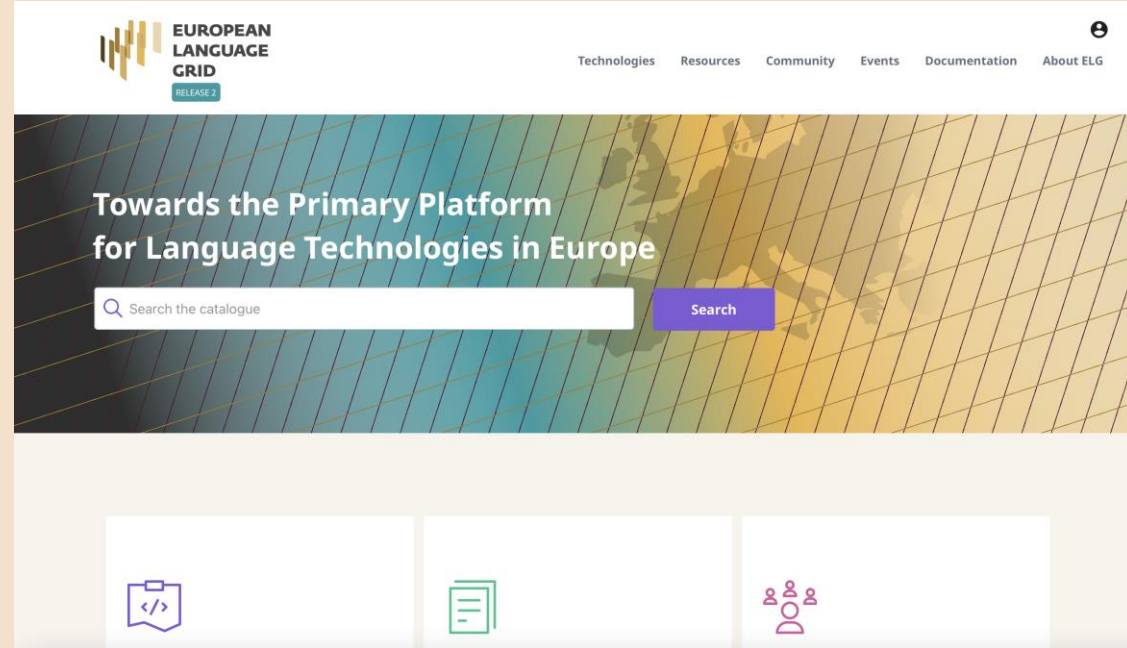
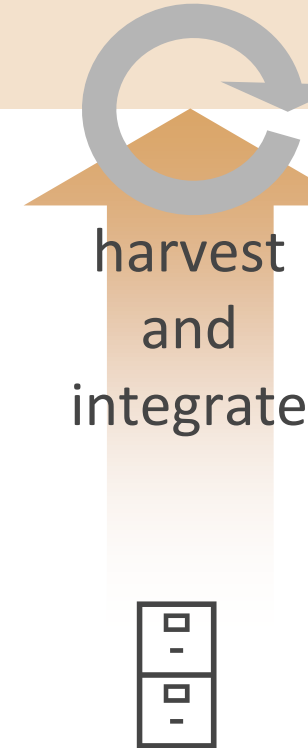
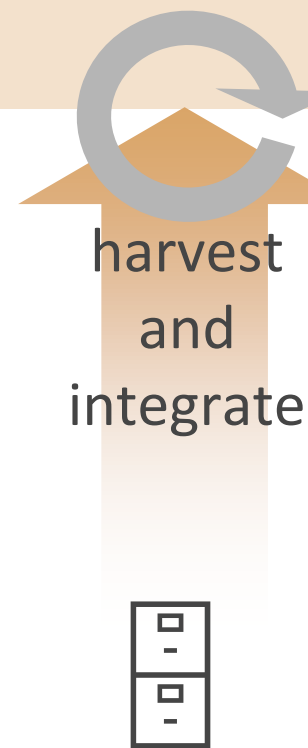
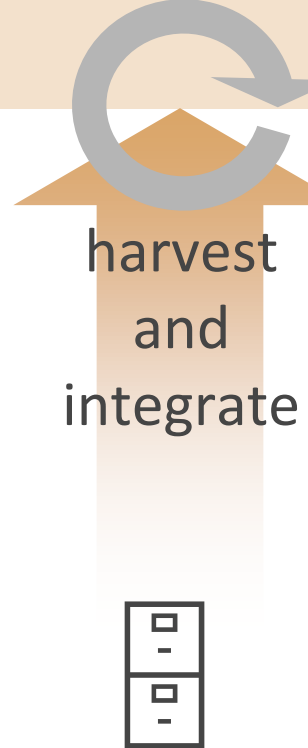
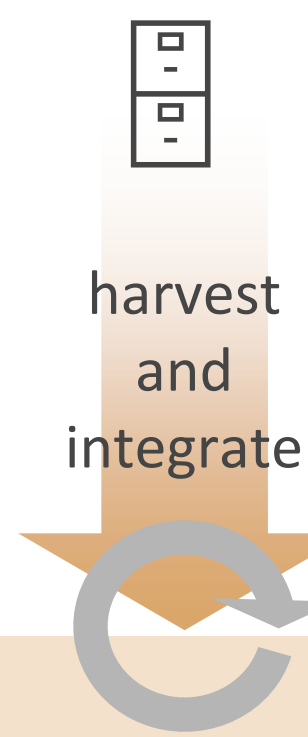
META-SHARE

ELRC-SHARE

OPUS

Zenodo

Harvest all relevant LT/LR repositories on a regular basis, collect metadata about resources and make them available through ELG for increased discovery and visibility



ELRA

HuggingFace

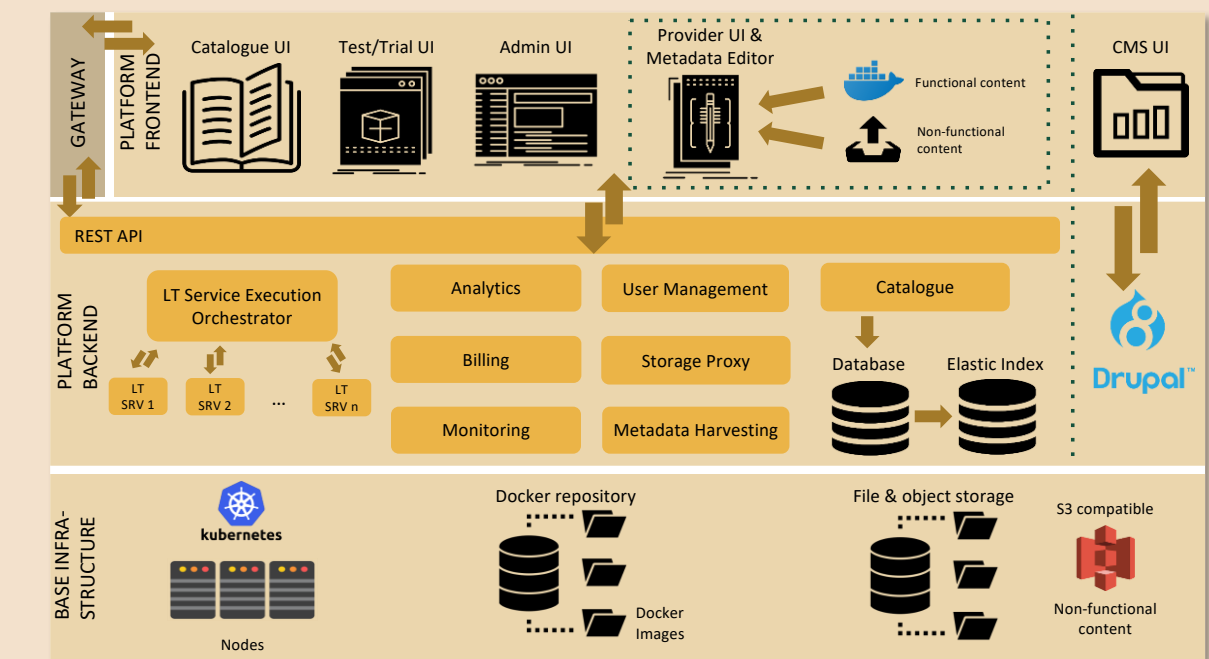
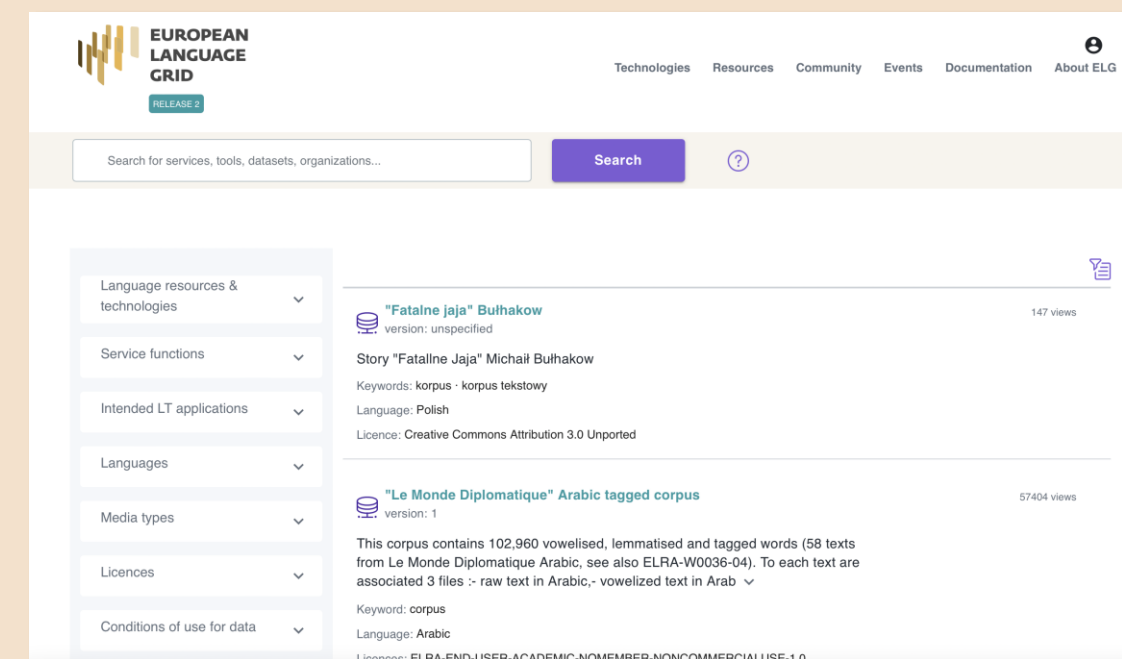
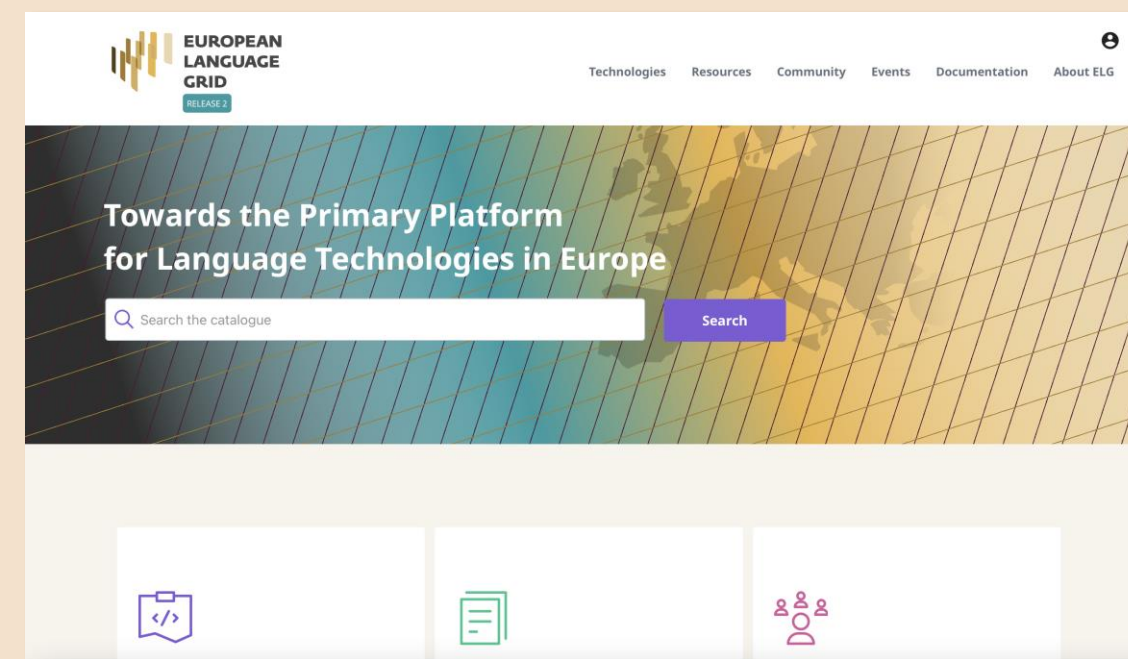
CLARIN

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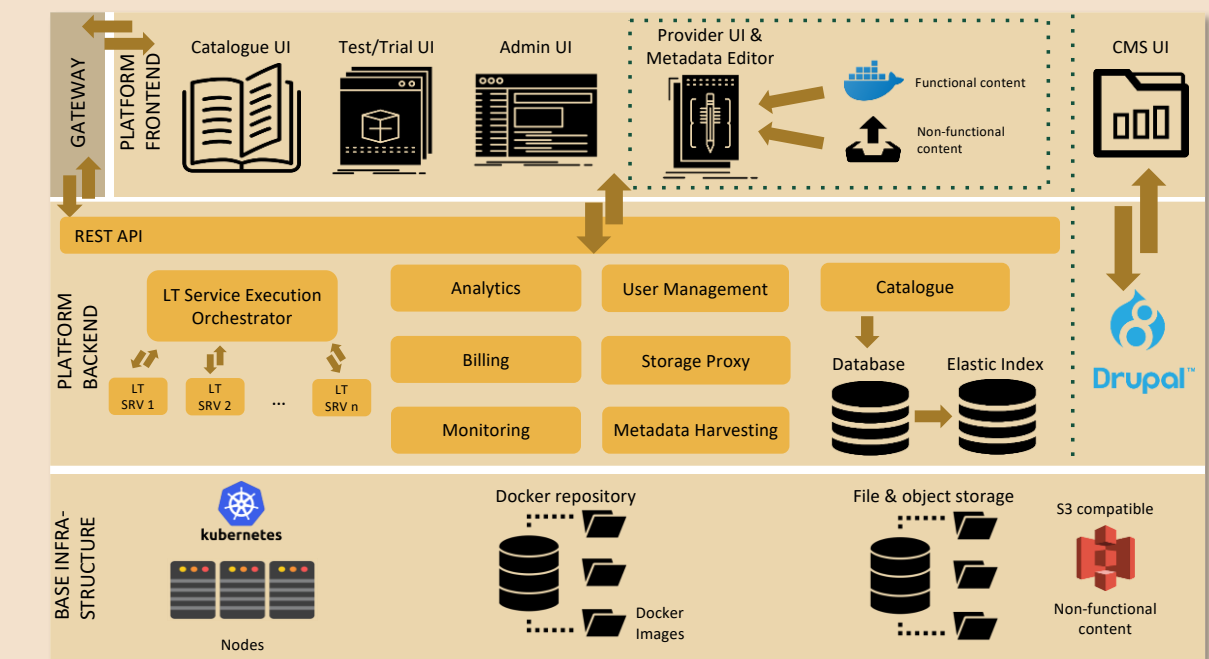
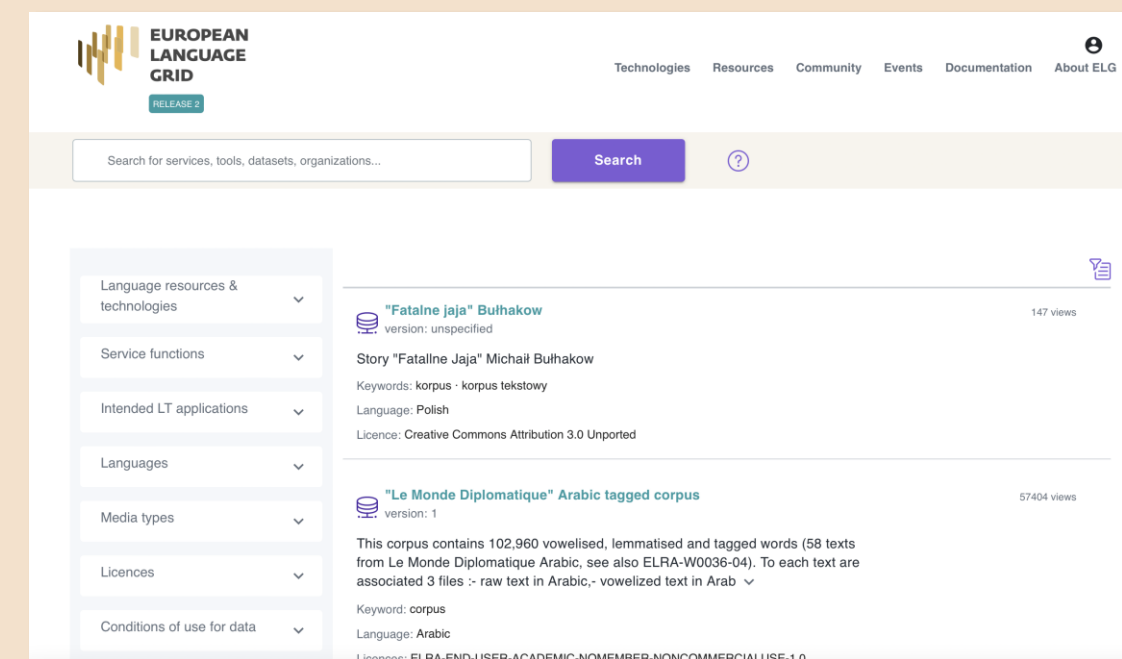
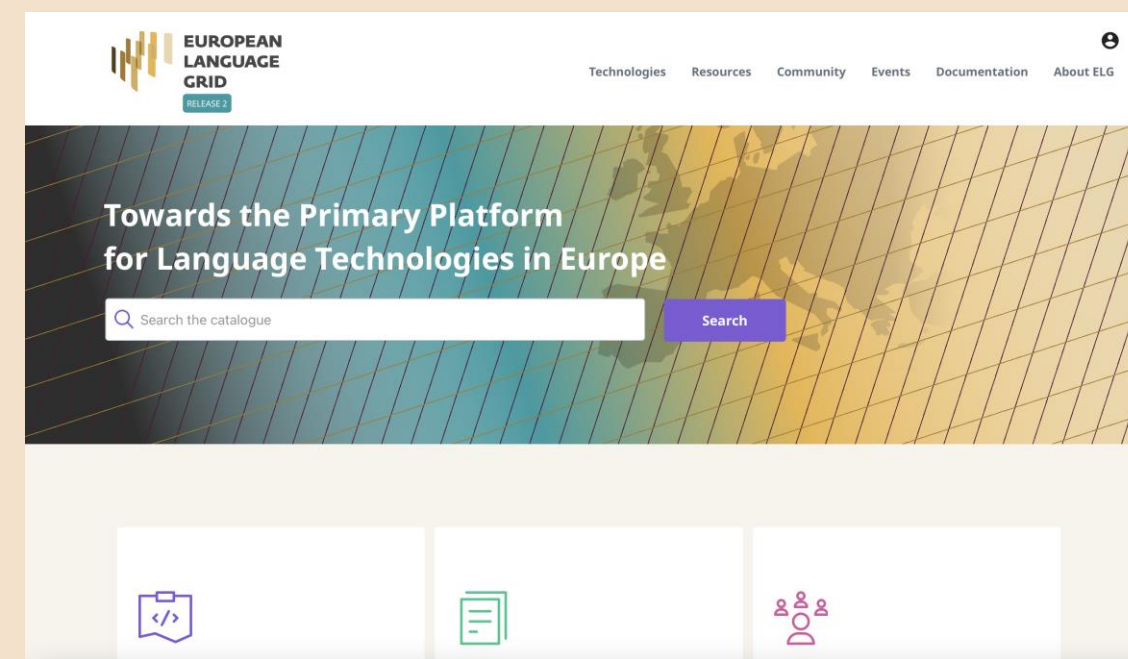
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Harvesting of Language Technology-related Resource, Data, Tool and Model Repositories

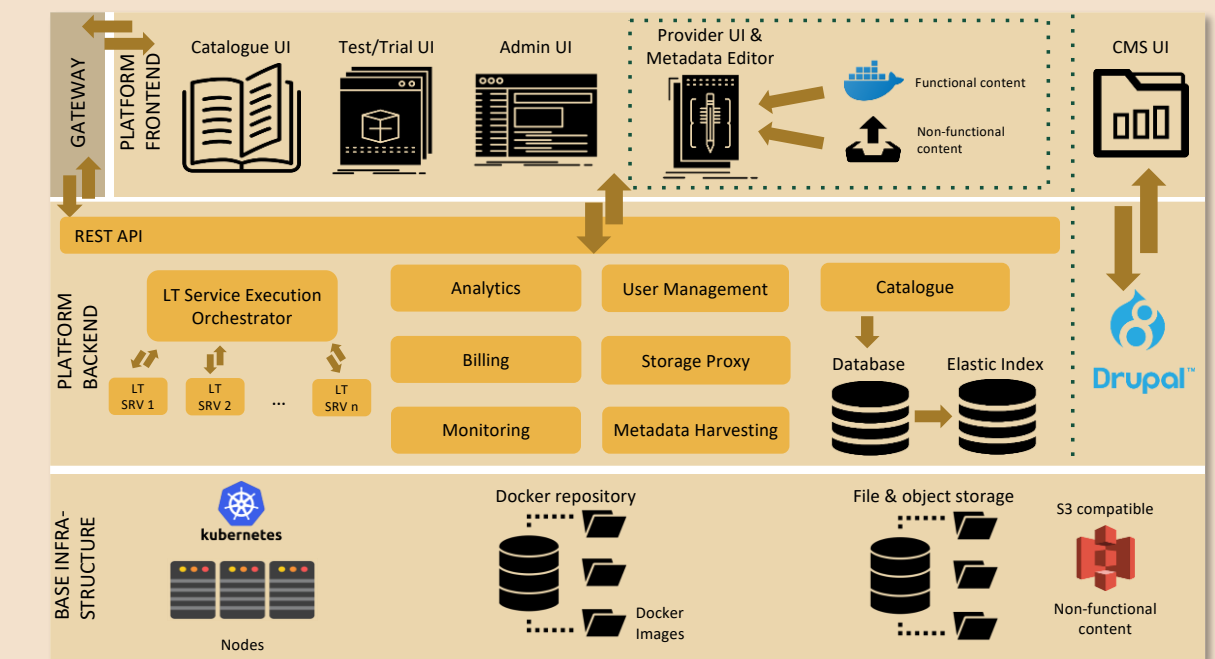
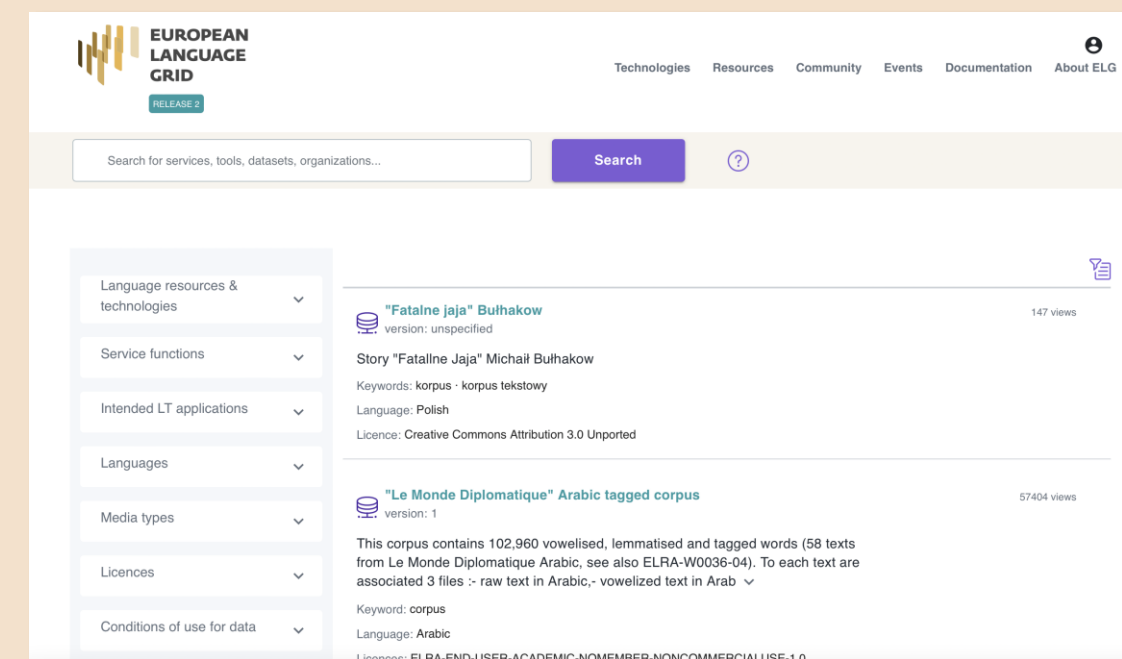
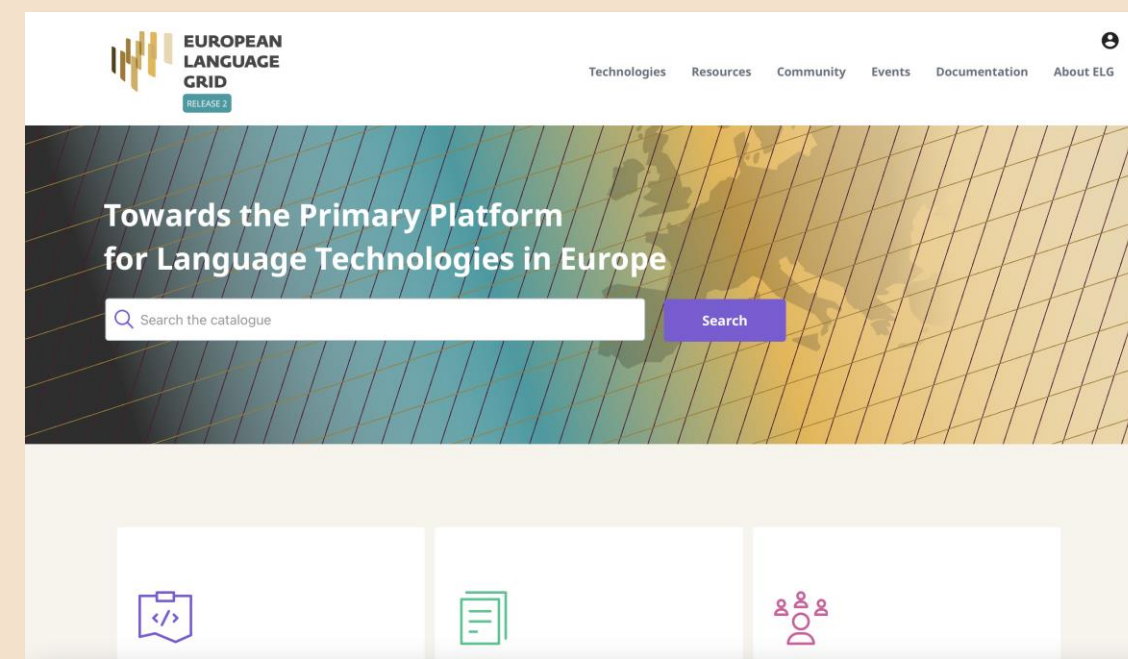




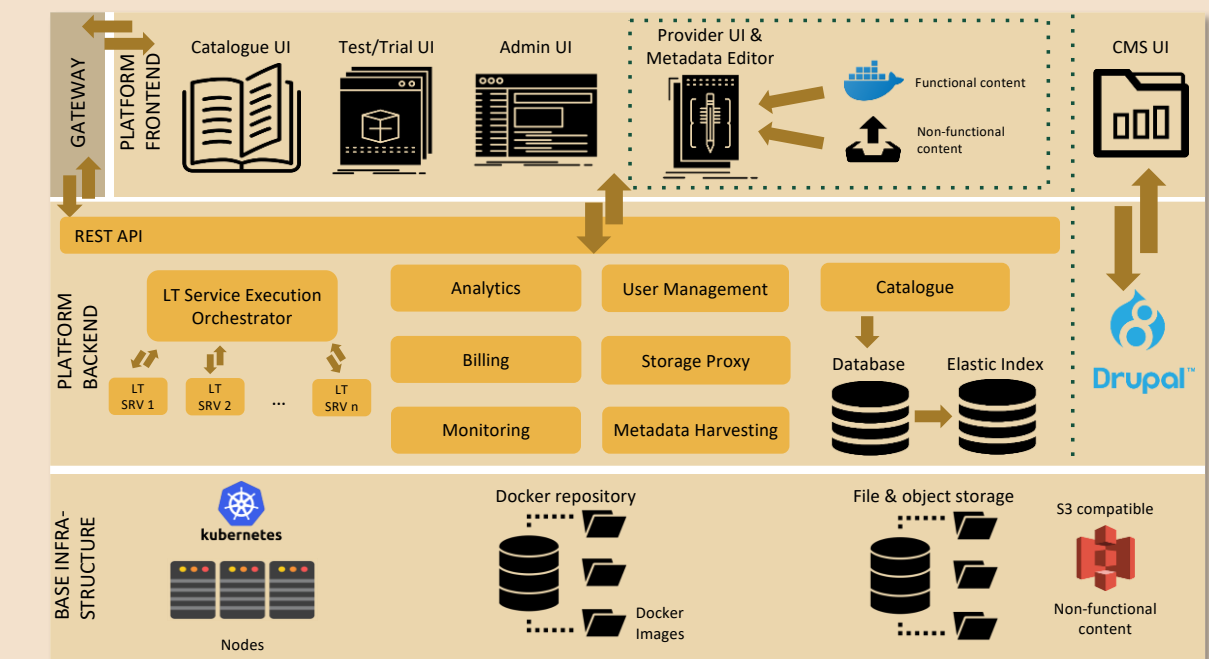
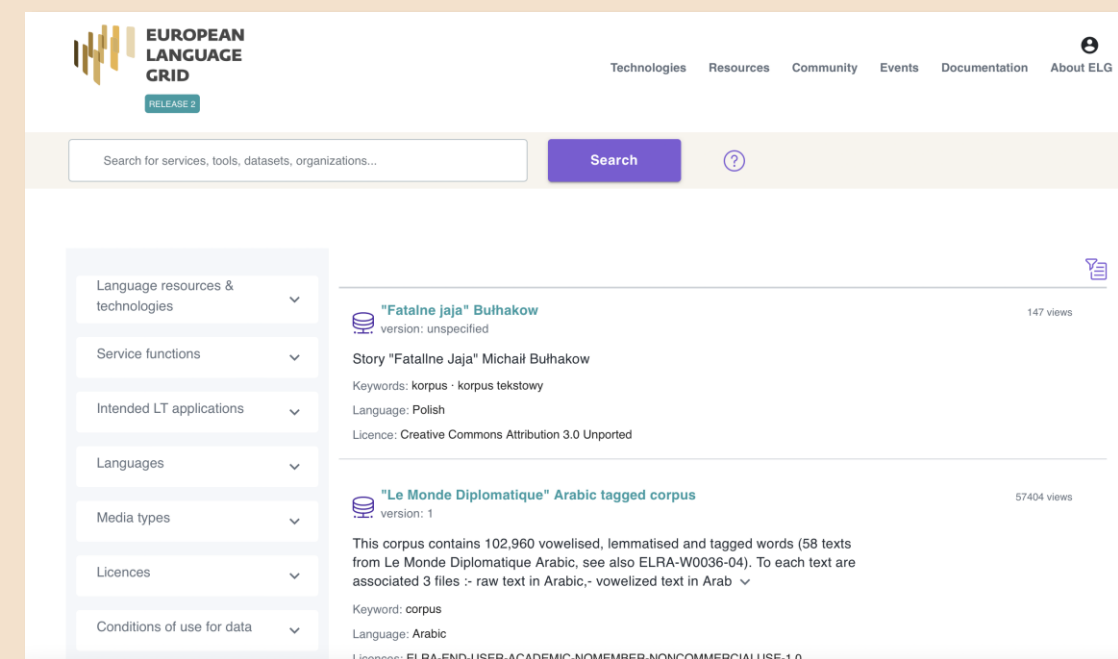
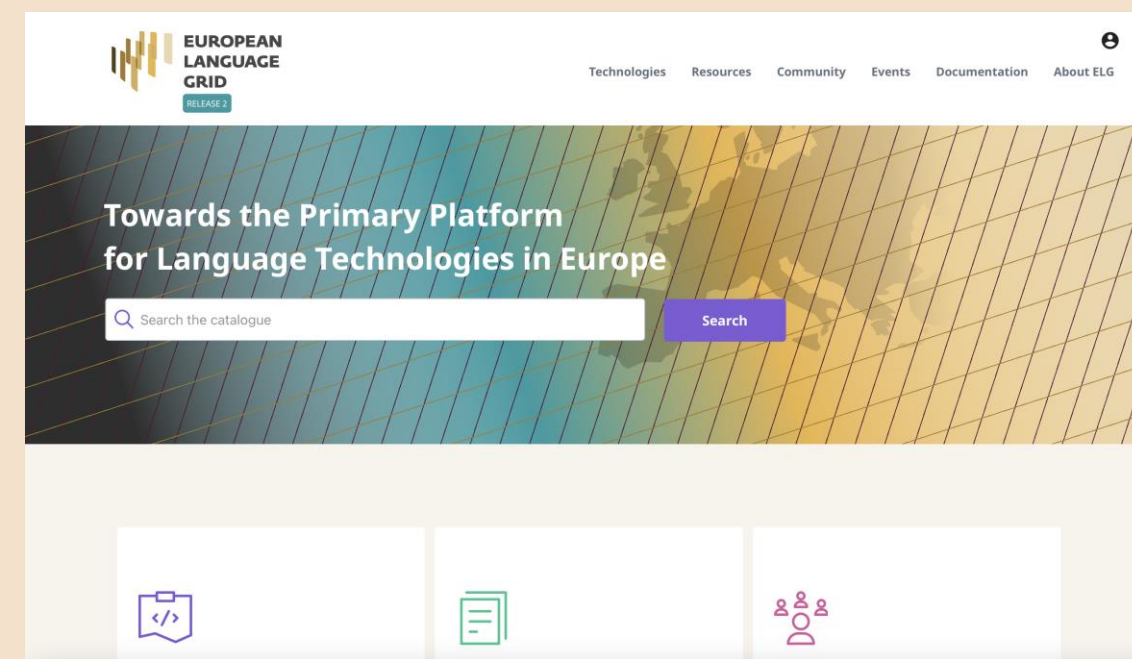
European Language Grid is a **joint technology platform** for the whole European Language Technology community (approx. 1800 organisations)



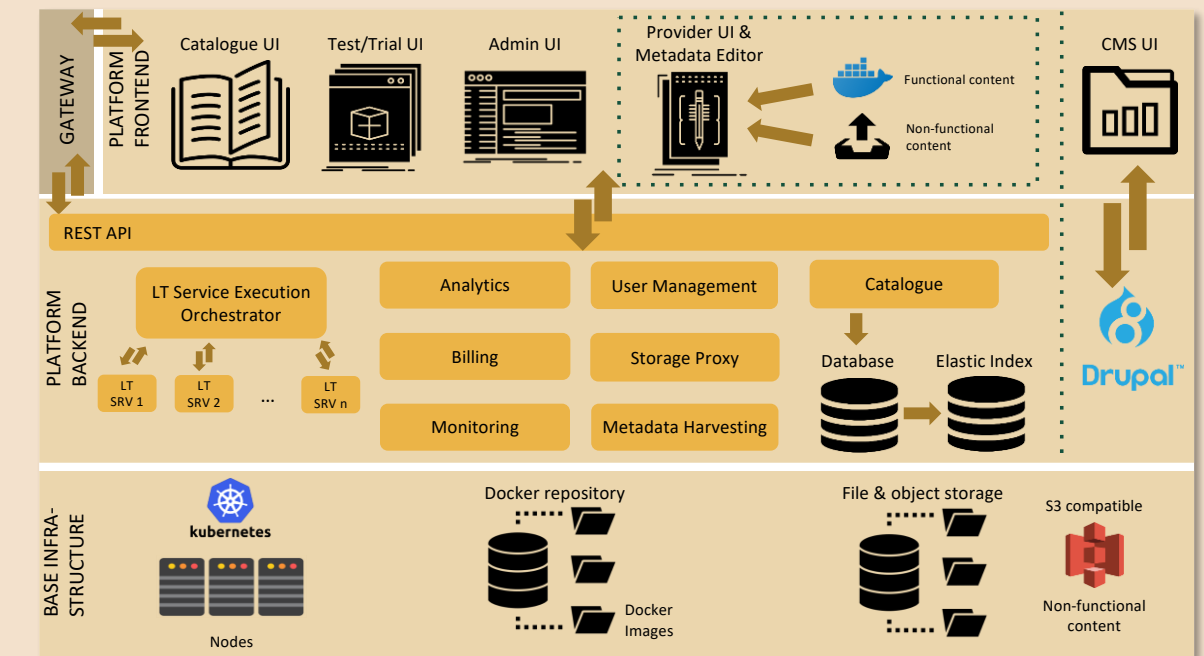
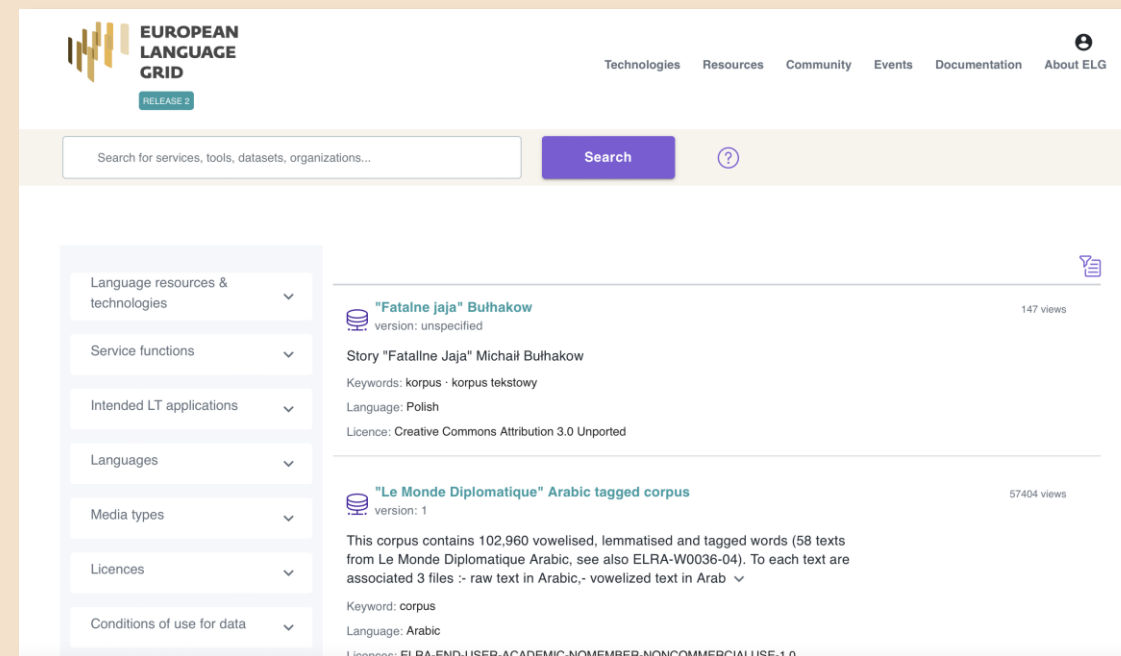
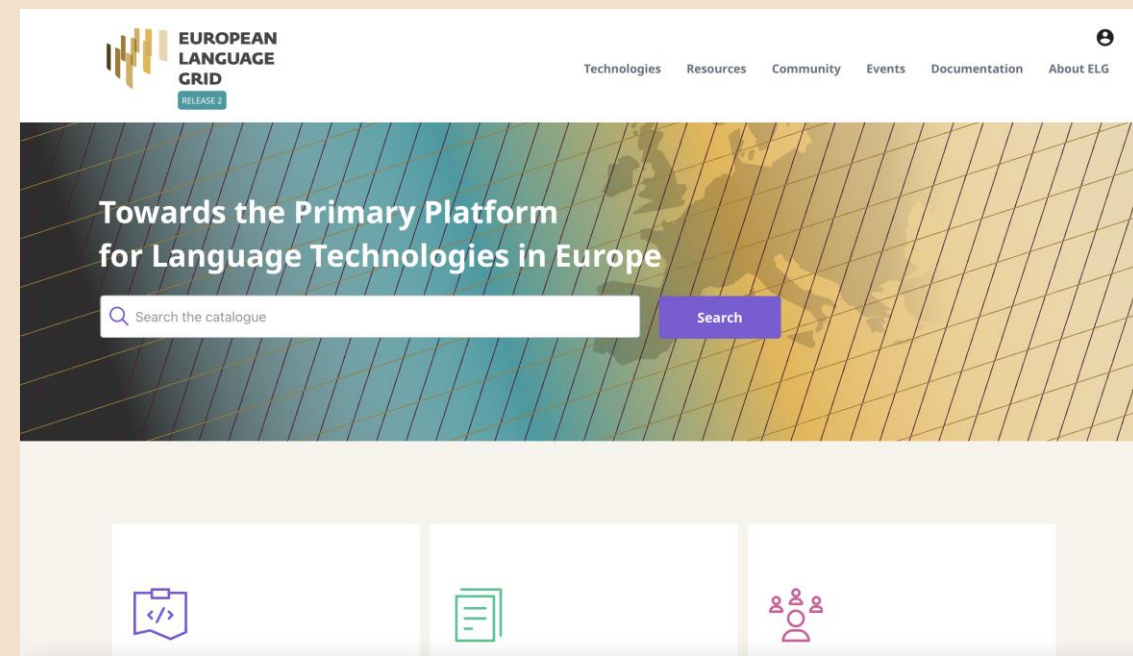
European Language Grid is a joint data, tool and resource sharing platform



European Language Grid is a **marketplace** for the whole European Language Technology community



European Language Grid is the **yellow pages** of the European Language Technology community



We want to make available all European Language Technologies and Language Resources in a one-stop-shop

Browsing the ELG catalogue

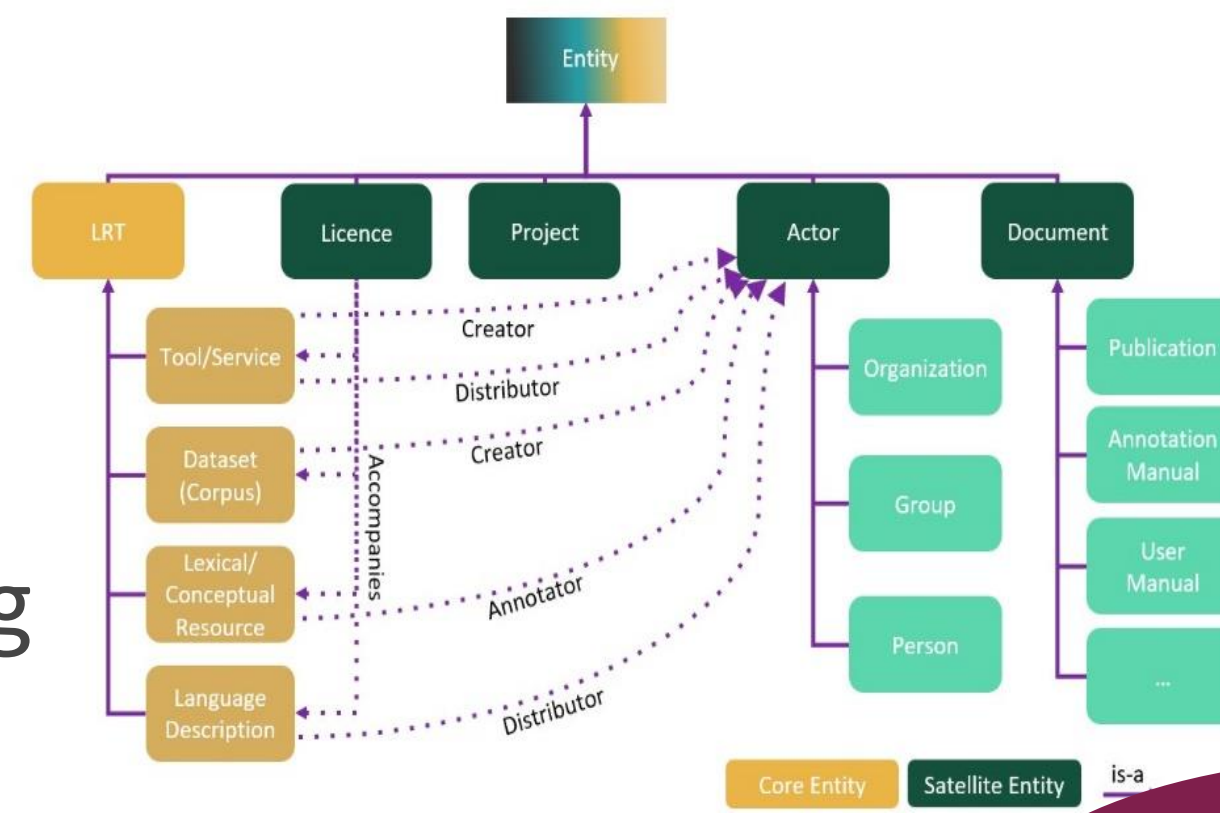
Downloading a resource

Testing an MT service

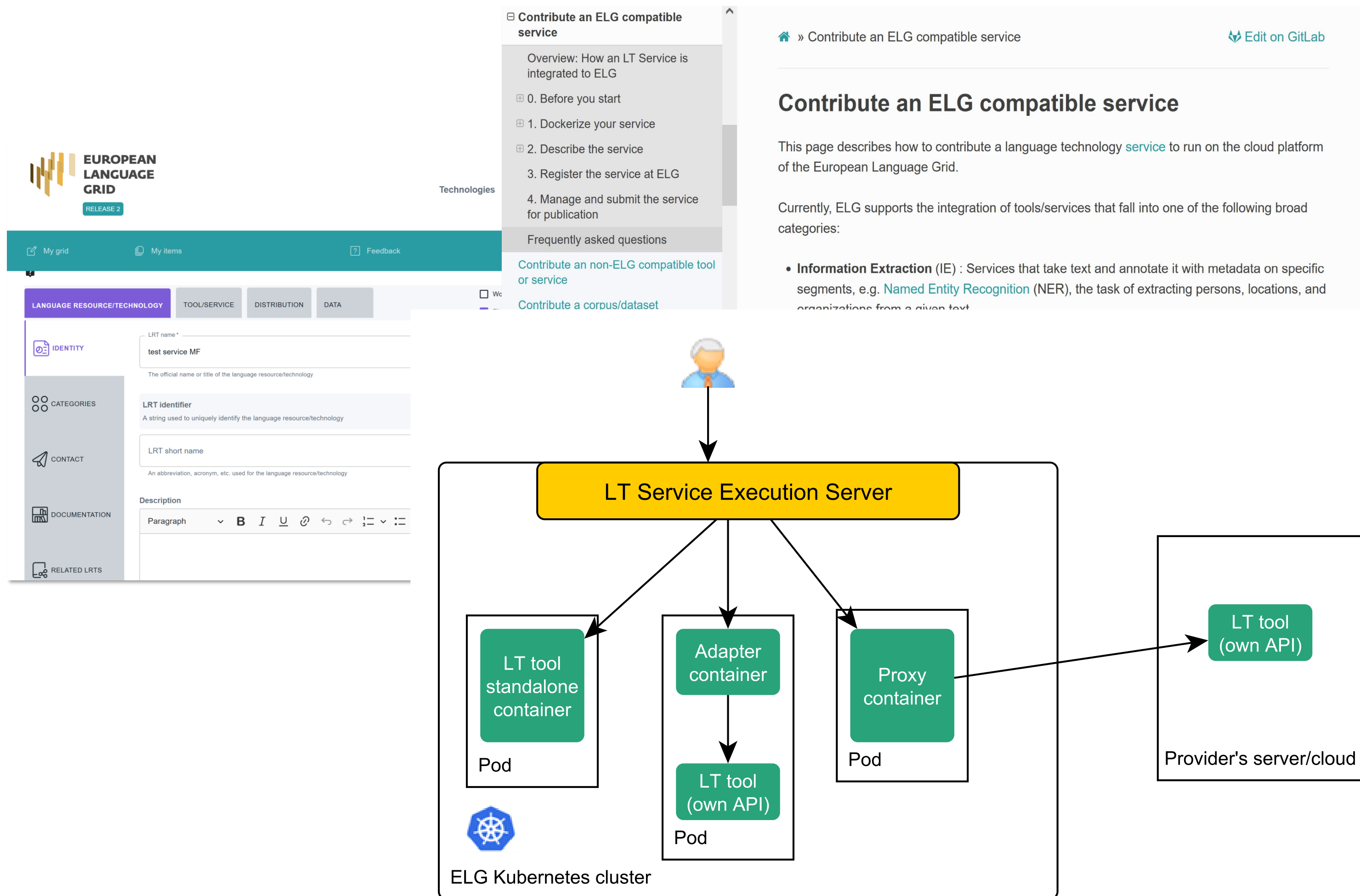
Testing a dependency parser

On the provider side

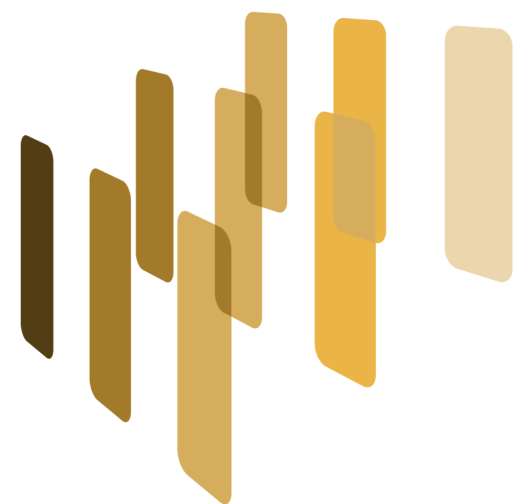
- LT community members
 - can **contribute** by providing formal descriptions compliant with a dedicated metadata schema
 - describe **organisations** (parents or divisions) & **projects**
 - describe & provide access (remote or integrated in ELG) **LRTs**
 - **linked with each other**
- must register and get authenticated as providers



A few details on service provision



- LT service providers need to provide a **Docker image** with their LT tool or service
- Docker images have to be uploaded to a **Docker registry** (e.g., GitLab, DockerHub)
- **Three different options:**
 - LT tool packaged in one Docker image exposing an ELG-compliant endpoint
 - LT tool running outside the ELG infrastructure – proxy image with one or more ELG-compliant endpoints
 - LT tool requiring an adapter – adapter image exposes an ELG-compliant endpoint as proxy



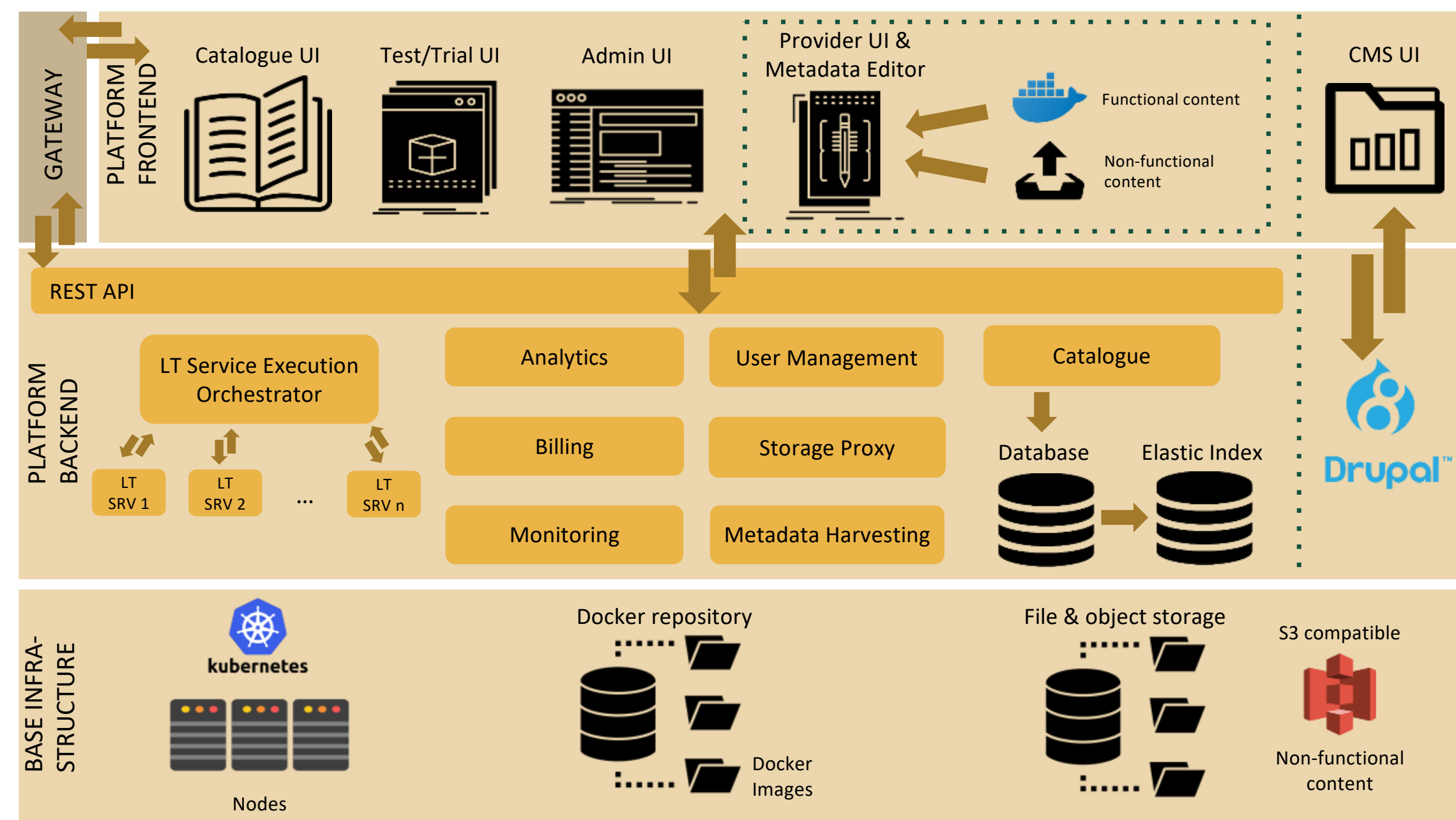
EUROPEAN LANGUAGE GRID

Current State of Play (May 2022) Release 2

- **12,000+ Resources**
 - 6271 corpora and data sets
 - 3102 services and tools
 - 772 services integrated and running in ELG
 - 2241 lexical/conceptual resources
 - 487 models and grammars
- **1778 LT organisations** (companies, research organisations)

Users can connect to the ELG cloud platform via ELG APIs, remote APIs, ELG GUI, Python SDK, download of containers or source code.

Sources			
+ ELG / ELE	(8785)	+ Quantum Stat Datasets	(261)
+ ELRC-SHARE	(1299)	+ CLARIN-PL	(254)
+ ELRA Catalogue of Language Resources	(1180)	+ CLARIN.SI	(218)
+ Zenodo	(492)	+ LREC Shared LR (ELRA)	(144)
+ Hugging Face	(385)	+ META-SHARE/ILSP	(69)
+ LINDAT/CLARIAH-CZ	(353)	+ META-SHARE/DFKI	(2)
		+ TUdatalib	(1)
		+ labsai/eddi	(1)



European LT Industry in the ELG

Clear all filters

Language resources & technologies

- + Corpus (1857)
- + Lexical/Conceptual resource (728)
- + Tool/Service (168)
- + Language description (7)

Service functions

- + Part-of-Speech Tagging (72)
- + Tokenization (67)
- + Lemmatization (61)
- + Dependency parsing (60)
- + Morphological annotation (60)

Languages

Official EU Languages

- + English (1684)
- + Spanish (503)
- + German (389)
- + French (374)
- + Czech (264)

Other EU/European languages

- + Russian (71)
- + Turkish (58)
- + Norwegian Bokmål (49)
- + Catalan (48)
- + Basque (46)

Other languages

- + Chinese (144)
- + Arabic (118)
- + Japanese (95)
- + Korean (71)
- + Persian (61)

Licences

- + AGREEMENT ON THE USE OF DATA IN QT21 APE Task (18)
- + Apache License 2.0 (44)
- + CC BY-NC 3.0 (Attribution-NonCommercial 3.0 Unported) (7)
- + CC BY-NC-ND 3.0 (Attribution-NonCommercial-NoDerivs 3.0 Unported) (13)
- + CC BY-NC-SA 3.0 (Attribution-NonCommercial-ShareAlike 3.0 Unported) (47)

Related entities

- + Organization (927)
- + Project (23)

3710 search results

"Al wassit" Arabic dictionary

An XML-based file containing the electronic version of al wassit dictionary. An Arabic monolingual dictionary accomplished by the Academy of the Arabic Language in Cairo

Keyword: lexical semantics
Language: Arabic
Licence: Creative Commons - Attribution-NonCommercial 4.0 International (CC BY-NC 4.0)

Lexical/Conceptual resource
114 views

"Al wassit" LMF Arabic dictionary

An LMF conformant XML-based file containing the electronic version of al wassit dictionary. An Arabic monolingual dictionary accomplished by the Academy of the Arabic Language in Cairo

Keyword: lexical semantics
Language: Arabic
Licence: Creative Commons - Attribution-NonCommercial 4.0 International (CC BY-NC 4.0)

Lexical/Conceptual resource
21 views

"Le Monde Diplomatique" Arabic tagged corpus

This corpus contains 102,960 vowelised, lemmatised and tagged words (58 texts from Le Monde Diplomatique Arabic, see also ELRA-W0036-04). To each text are associated 3 files : - raw text in Arabic, - vowelized text in ...

Keyword: corpus
Language: Arabic
Licences: ELRA-VAR-COMMERCIAL-MEMBER-COMMERCIALUSE-1.0
ELRA-END-USER-ACADEMIC-NOMEMBER-NONCOMMERCIALUSE-1.0 ...

Corpus
1 views

"Le Monde Diplomatique" Text corpus in Arabic

Electronic archiving of "Le Monde Diplomatique" articles in Arabic from 2000. The corpus is available in HTML. Each HTML file contains one article. Number of articles available per year : • 2000: 61 articles (November a ...

Keyword: corpus
Language: Arabic
Licences: ELRA-END-USER-COMMERCIAL-MEMBER-NONCOMMERCIALUSE-1.0
ELRA-END-USER-ACADEMIC-NOMEMBER-NONCOMMERCIALUSE-1.0 ...

Corpus
1 views

"Le Monde Diplomatique" Text corpus in English

Electronic archiving of "Le Monde Diplomatique" articles in English from 1999. The corpus is available in HTML. Each HTML file contains one article. Number of articles available per year : • 1999: 184 articles (292,908 ...

Keyword: corpus
Language: English
Licences: ELRA-END-USER-COMMERCIAL-MEMBER-NONCOMMERCIALUSE-1.0
ELRA-END-USER-ACADEMIC-NOMEMBER-NONCOMMERCIALUSE-1.0 ...

Corpus
1 views

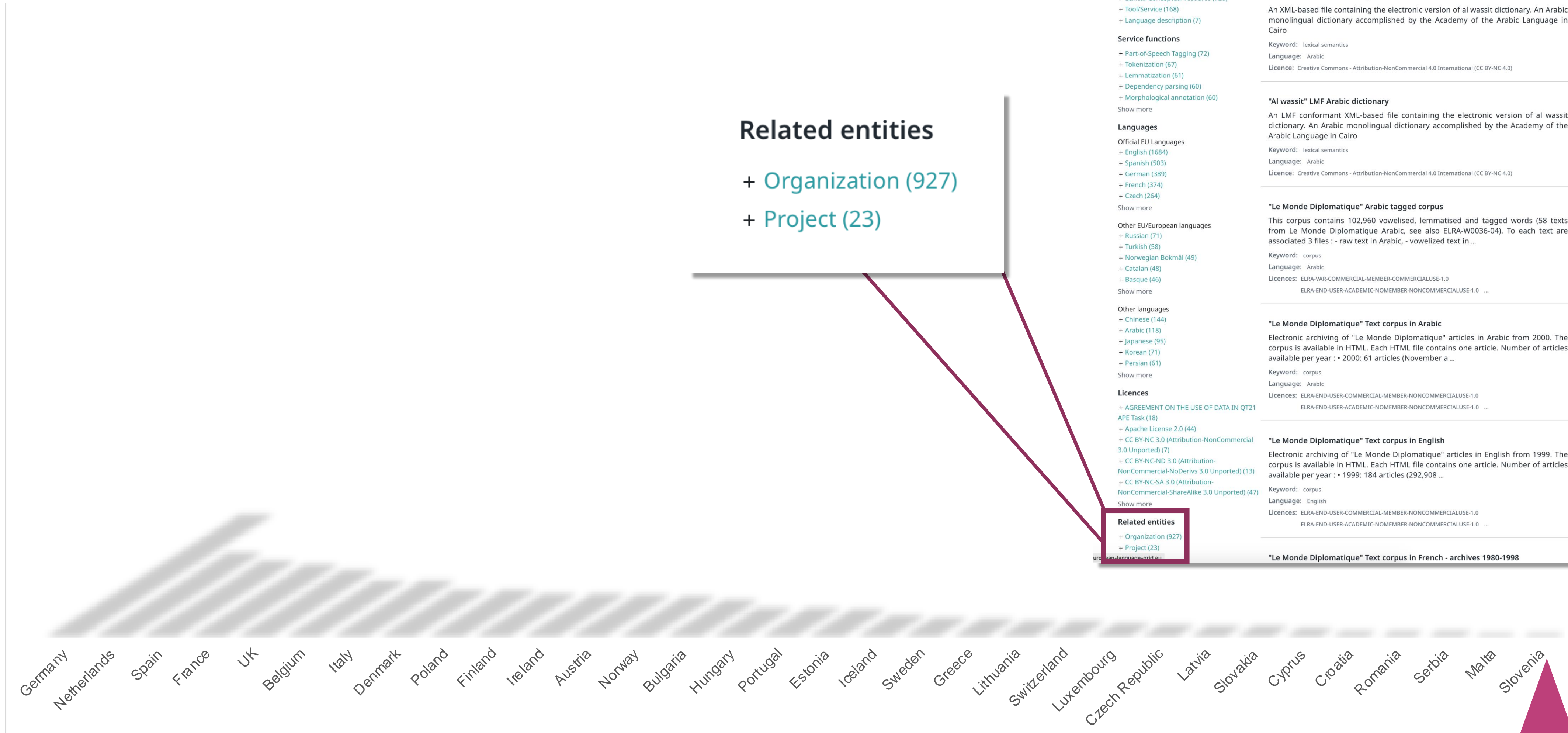
"Le Monde Diplomatique" Text corpus in French - archives 1980-1998

Corpus

Related entities

+ Organization (927)

+ Project (23)



Stakeholders and Users and Collaborators

ELG Open Calls: 15 pilot projects

ICT-29b research and innovation projects

ELE – European Language Equality

AI4EU – European AI on demand platform

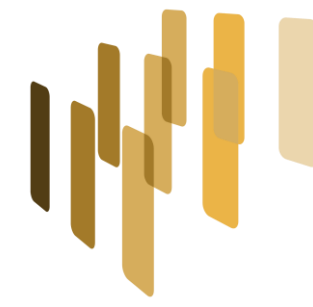
Other related projects: Elexis, Lynx, MeMAD, CEF INEA projects (MAPA, NTEU etc.), OpenGPT-X, NFDI4DataScience etc.

Core networks: META-NET, LT Innovate

Additional initiatives: CLAIRE, AI PPP, ELRC, ECSPM, EFNIL, BDVA, NPLD, CLARIN, W3C, NGI, RDA, EOSC, OpenAIRE etc.



Community: NCCs and LTC



32 National Competence Centres (NCCs)


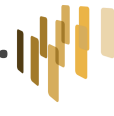


- Strong international network of national networks to broaden ELG's reach, identify content for the ELG and interest companies in using the ELG.
- Main goal: *support the mission of the ELG project.*



European LT Council (LTC) (work in progress)

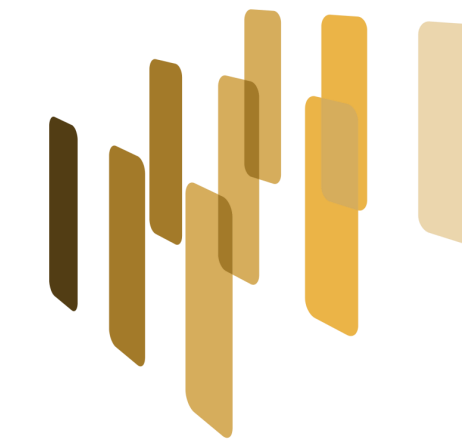
- A pan-European body, in which strategic LT-related matters can be discussed and coordinated.
- Main goal: *represent and support European LT community.*

**EUROPEAN
LANGUAGE
EQUALITY**

1. **Austria:** Dagmar Gromann, Zentrum für Translationswissenschaft, Universität Wien
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12.  **Greece:** Maria Gavriilidou, ILSP, R.C. “Athena”
13. **Hungary:** Tamás Várardi, Research Institute for Linguistics, Hungarian Academy of Sciences
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15. **Ireland:** Andy Way, ADAPT Centre and School of Computing, Dublin City University
16. **Italy:** Bernardo Magnini, Human Language Technology, Fondazione Bruno Kessler (FBK)
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21. **Netherlands:** Vincent Vandeghinste, Dutch Language Institute, Centre for Computational Linguistics, University of Leuven
22. **Norway:** Kristine Eide, The Language Council of Norway – Språkrådet
23. **Poland:** Maciej Ogrodniczuk, Institute of Computer Science, Polish Academy of Sciences
24. **Portugal:** António Branco, Department of Informatics, University of Lisbon
25. **Romania:** Dan Tufis, Research Institute for Artificial Intelligence, Romanian Academy of Sciences
26. **Serbia:** Cvetana Krstev, Faculty of Mathematics, Belgrade University (UBG)
27. **Slovakia:** Radovan Garabik, Ludovít Stur Institute of Linguistics, Slovak Academy of Sciences
28. **Slovenia:** Simon Krek, Jozef Stefan Institute
29. **Spain:** Marta Villegas, Barcelona Supercomputing
30. **Sweden:** Jens Edlund, Speech, Music & Hearing/Språkbanken Tal, KTH Royal Institute of Technology
31. **Switzerland:** Hervé Boudlard, Idiap Research Institute
32.  **UK:** Kalina Bontcheva, Department of Computer Science, University of Sheffield

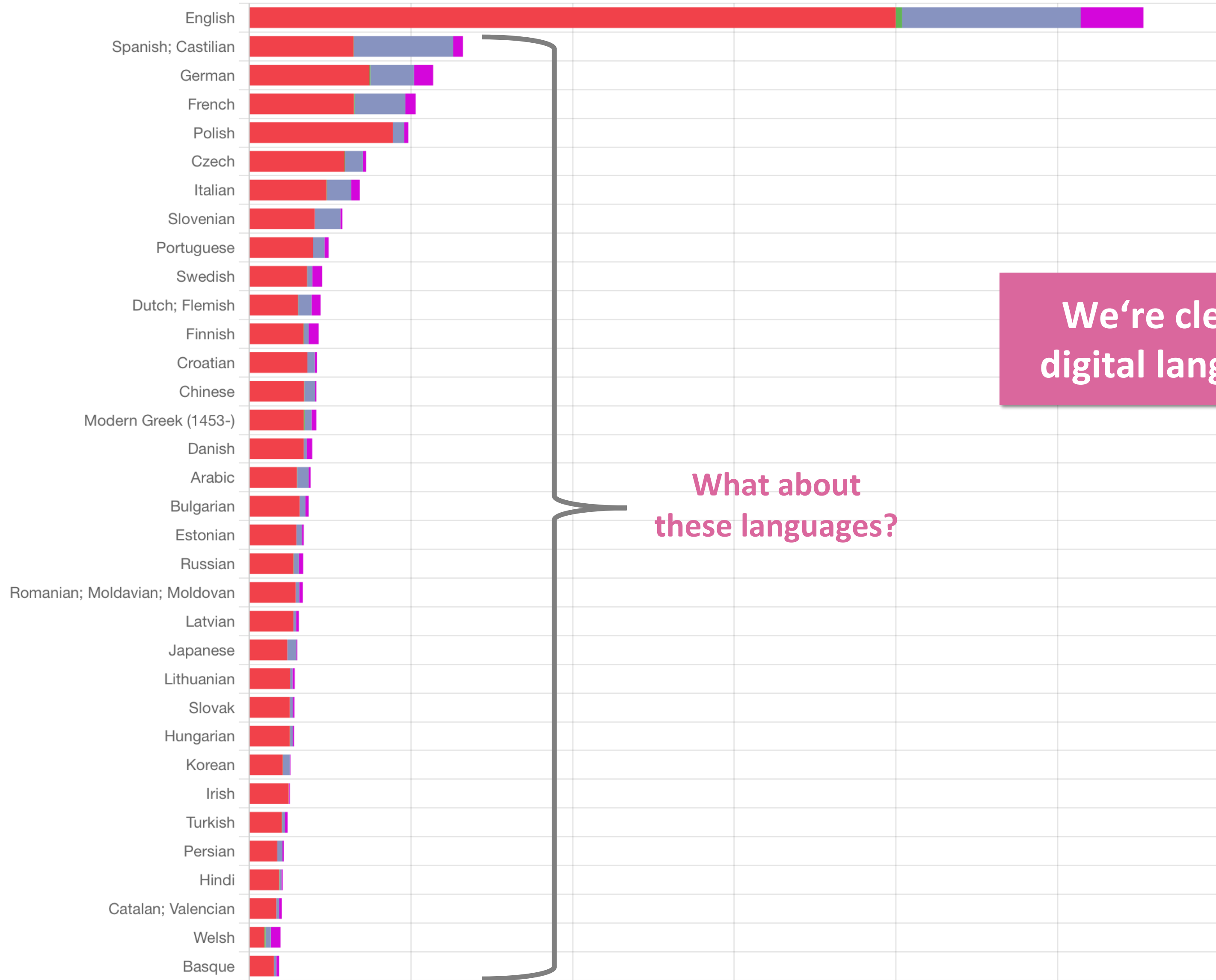


Languages of the Resources



**EUROPEAN
LANGUAGE
GRID**

■ Corpus
 ■ LanguageDescription
 ■ LexicalConceptualResource
 ■ Organization
 ■ Project
 ■ ToolService



We're clearly very far away from digital language equality in Europe.

What about these languages?

ELG's Sister Project European Language Equality (ELE)



Consortium: 52 partners from all over Europe
Coordinator: ADAPT Centre (Dublin City University)
Co-Coordinator: DFKI

Objective: *development of a strategic research, innovation and deployment agenda to achieve digital language equality in Europe by 2030*

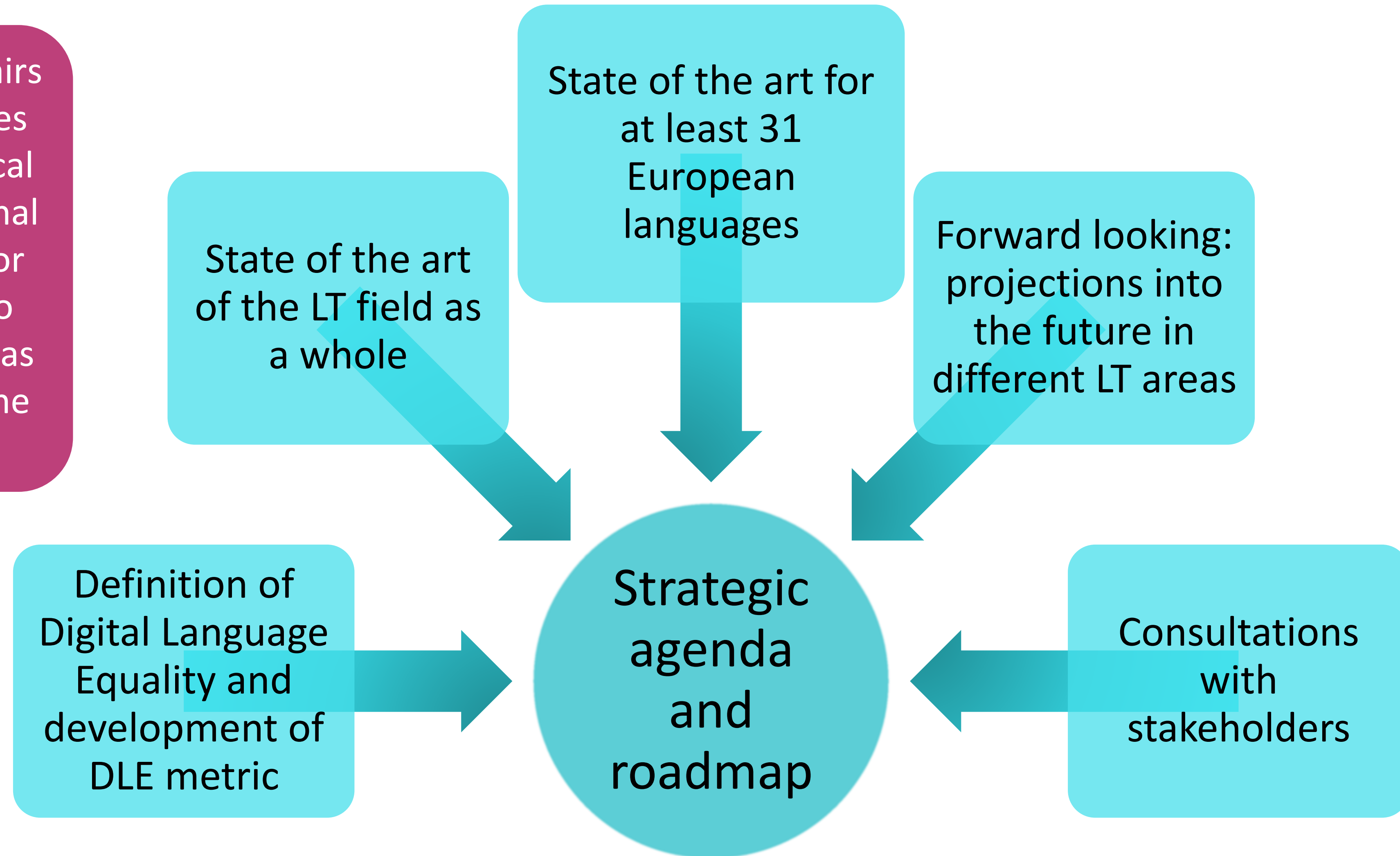
Runtime: 18 months – ELE and ELG will both finish up in June 2022 with a joint META-FORUM 2022

Started on 1 January 2021

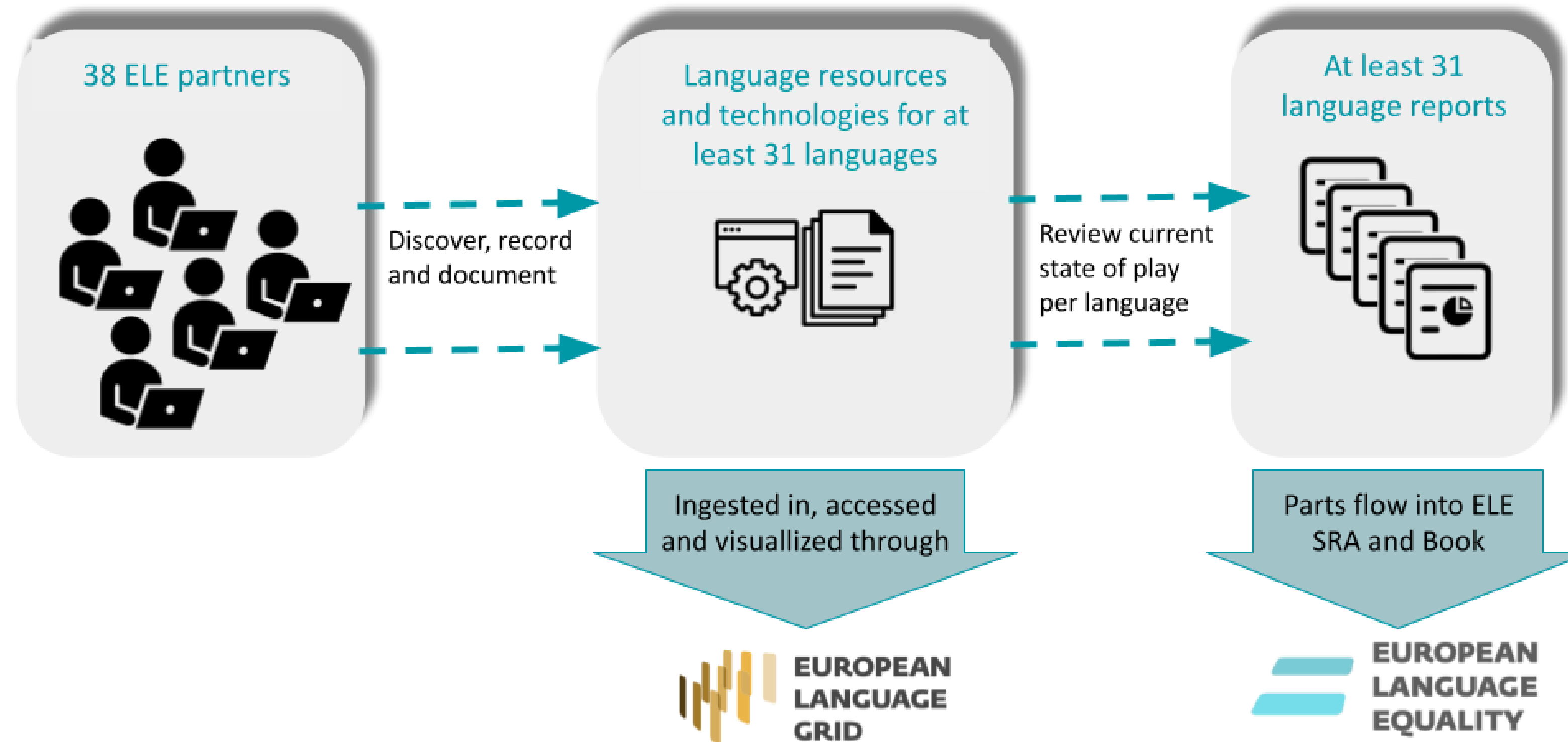
<http://www.european-language-equality.eu>

Approach

DLE: The state of affairs in which all languages have the technological support and situational context necessary for them to continue to exist and to prosper as living languages in the digital age



Campaign for the documentation of LRTs



List of all languages investigated by the ELE consortium:

<https://european-language-equality.eu/languages/>

Language reports

- Tradition of META-NET White papers
- Quantitative and qualitative evaluations of the level of support each language receives through technology:
 - brief introduction to the LT field
 - general facts about the language
 - availability of LRTs
 - support it receives through dedicated funding programs and projects
 - participation in research infrastructures
 - ...
- Language reports available at: <https://european-language-equality.eu/deliverables/>
- Parts included in the final ELE agenda and book.

D1.27	Report on Polish	IIPAN	February 2022	24 pages
D1.28	Report on Portuguese	FCULisbon	February 2022	21 pages
D1.29	Report on Romanian	ICIA	February 2022	22 pages
D1.30	Report on Slovak	JULS	February 2022	20 pages
D1.31	Report on Slovenian	JSI	February 2022	24 pages
D1.32	Report on Spanish	BSC	February 2022	25 pages
D1.33	Report on Swedish	KTH	April 2022	27 pages
D1.34	Report on Welsh	BNGR	February 2022	29 pages

Technological Factors

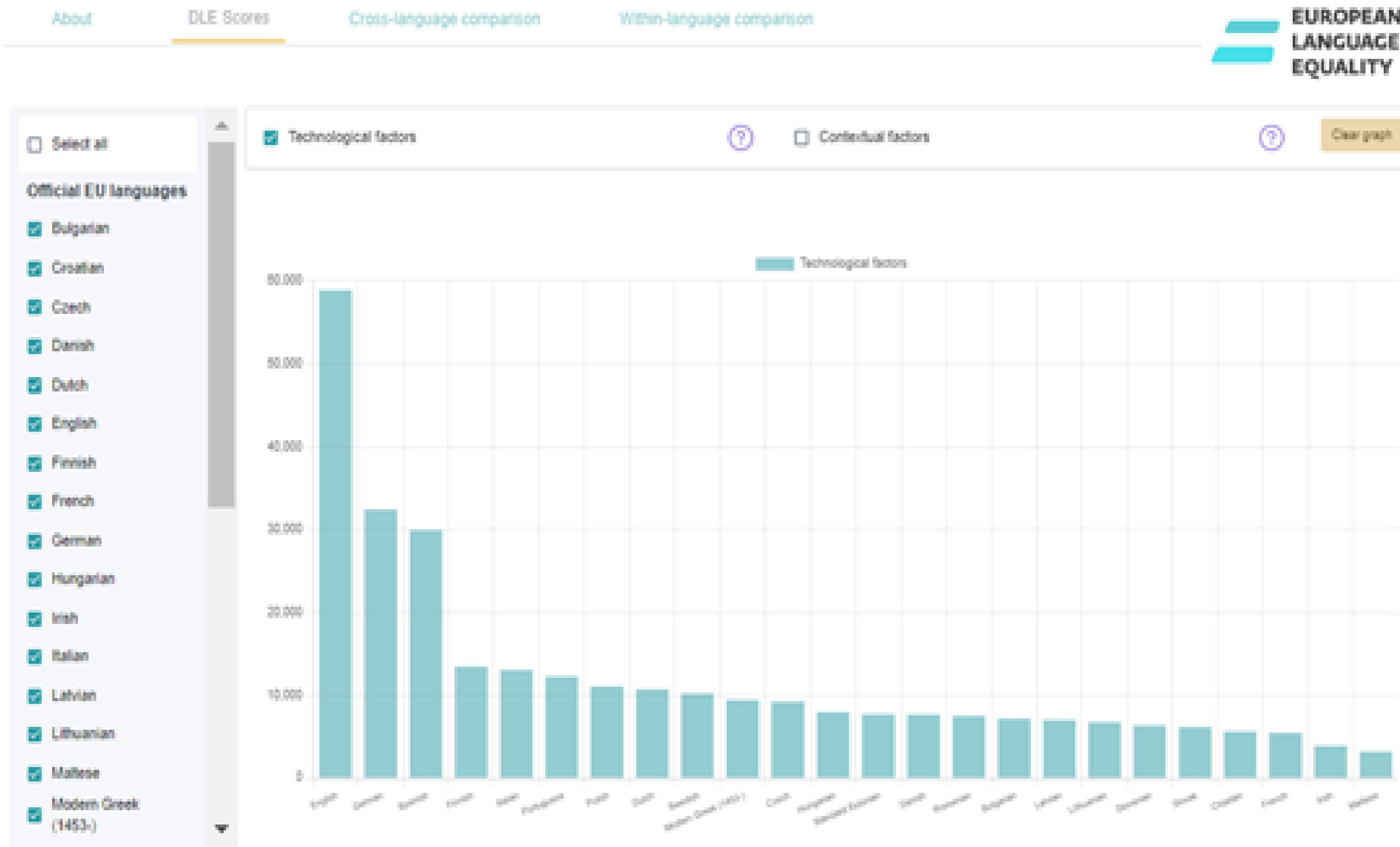
- Tools and Services
- Corpora
- Language Descriptions and Models
- Lexical and Conceptual Resources
- Projects
- Organisations



Contextual Factors

- Industry
- Online
- Research & Development & Innovation
- Technology
- Economy
- Education
- Funding
- Law
- Media
- Policy
- Public administration
- Society

ELG/ELE dashboard



- A web-based interactive dashboard developed by ELE as part of the ELG Platform which exposes the contents of the ELG catalogue as interactive visuals dynamically created by user queries
- Accessed at: <https://live.european-language-grid.eu/catalogue/dashboard>
- Why a dashboard? It provides
 - an easy-to-use mechanism for exposing and monitoring the technological and contextual factors that contribute to DLE
 - an updatable and comparable measurement of the level of LT support and provision that each European language enjoys.

META-FORUM Conference Series

META-FORUM 2022 – June 08-10, Brussels, Belgium

Save the date!

META-FORUM 2021 – November 15-17, *virtual conference*

Using the European Language Grid

META-FORUM 2020 – December 01-03, *virtual conference*

Piloting the European Language Grid

META-FORUM 2019 – October 08/09, Brussels, Belgium

Introducing the European Language Grid

META-FORUM 2017 – November 13/14, Brussels, Belgium

Towards a Human Language Project

META-FORUM 2016 – July 04/05, Lisbon, Portugal

Beyond Multilingual Europe

META-FORUM 2015 – April 27, Riga, Latvia

Technologies for the Multilingual Digital Single Market

META-FORUM 2013 – September 19/20, Berlin, Germany

Connecting Europe for New Horizons

META-FORUM 2012 – June 20/21, Brussels, Belgium

A Strategy for Multilingual Europe

META-FORUM 2011 – June 27/28, Budapest, Hungary

Solutions for Multilingual Europe

META-FORUM 2010 – November 17/18, Brussels, Belgium

Challenges for Multilingual Europe

META FORUM 2022

JOINING THE EUROPEAN LANGUAGE GRID:

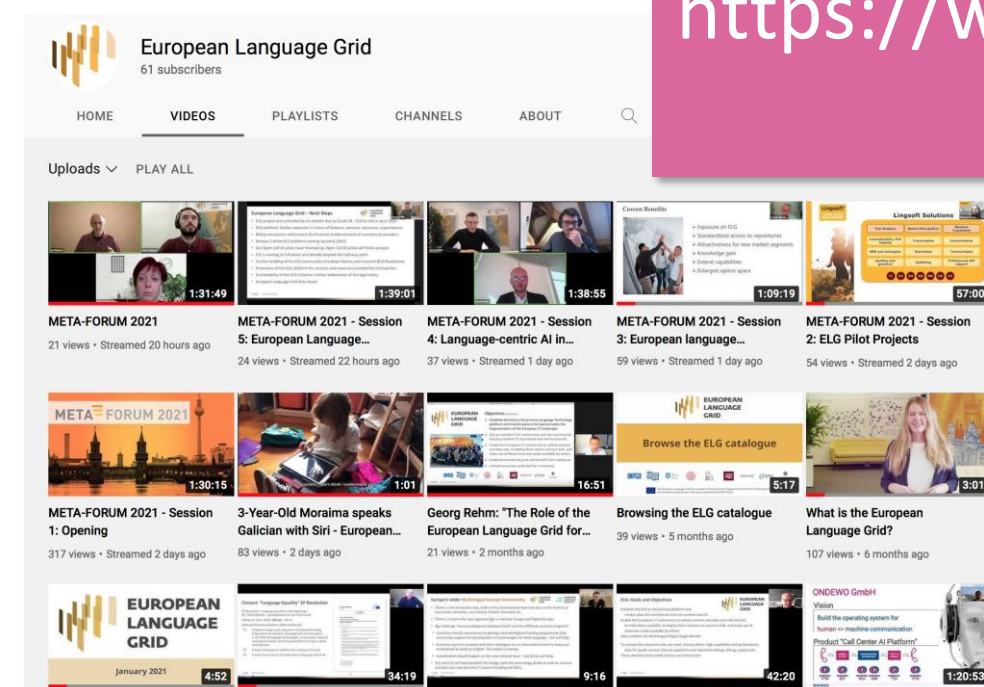
Together Towards Digital Language Equality

8/9 June 2022

Brussels, Belgium

All META-FORUM 2020 and META-FORUM 2021 sessions are available on the European Language Grid YouTube channel:

<https://www.youtube.com/channel/UCarEHmsWT2JslcvvWkbhL4A>



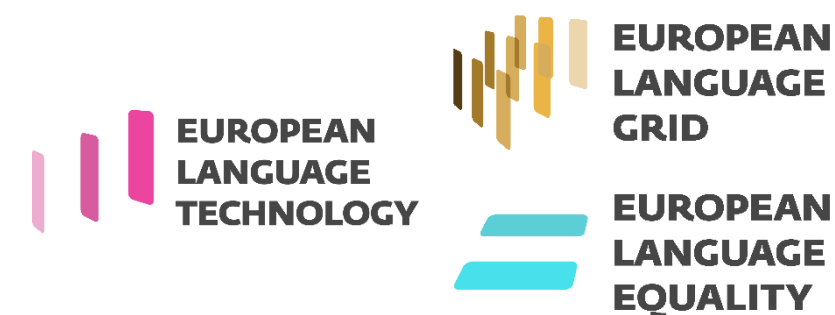


European Language Grid

With many thanks to all colleagues in the ELG and ELE teams and consortia!



Thank you!



Penny Labropoulou, Athena RC/ILSP



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25-05-2022 ELG NCC Workshop Bulgaria
<http://www.european-language-grid.eu>
<http://www.european-language-equality.eu>

