EUROPEAN LANGUAGE GRID

D7.3
Marketplace Report

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List of Acronyms

AI	Artificial Intelligence
ASR	Automatic Speech Recognition (Speech-to-Text)
DL	Deep Learning
CAGR	Compound Annual Growth Rate
ELG	European Language Grid
LTC	Language Technology Council
ELRC	Europen Language Resource Coordination
GDPR	General Data Protection Regulation
IE	Information Extraction
IR	Information Retrieval
IVR	Interactive Voices Response
KPI	Key Performance Indicator
LT	Language Technology / Technologies
ML	Machine Learning
MT	Machine Translation
NCC	National Competence Centre
NLP	Natural Language Processing
NLU	Natural Language Understanding
TM	Translation Memory
TMS	Translation Management System
TTS	Text-to-Speech, Speech Synthesis

Abstract

This Deliverable, D7.3 Marketplace Report, is the first of a series of interconnected deliverables describing the European LT landscape and providing the relevant context for ELG on its path to becoming the primary market place for LT in Europe. The central topic of this deliverable is the marketplace strategy itself. This strategy is tightly connected to the creation of value between participants of the ELG – the members of the community – and thus links to a spectrum of subjects concerning value creation and the associated value chains. It can neither be developed nor should it be viewed in isolation, but rather needs to be linked to aspects like innovation, sustainability, communication, community-building just to name a few. A marketplace strategy cannot be developed as a stand-alone module but at the same time clearly cannot comprehensively deal with all the above-mentioned topics. Consequently, the core of the market strategy and its interconnections to other areas are discussed in this deliverable. Viable business models centered around end-users, their needs and demands are put in focus rather than adopting a technology-driven approach, which has been shown to fall short of expectations in the past. Topics such as innovation, communication and sustainability have been or will be dealt with in subsequent deliverables (see D7.1, D7.8 and D8.4). Links to these are provided in numerous places within this report to outline the alley of further development. The foundations for this deliverable are provided by examining (the results of) previous studies and the current state of affairs. Both the supply as well as the demand-perspective of European LT is discussed and the importance of the ELG as a potential one-stop-shop for LT in Europe – and with that as an LT-hub for the multilingual Digital Single Market – is detailed before touching upon matters regarding innovation. Innovation, which is interpreted as the combination of invention and adoption is identified as a key element, along with trust in the ELG and a confident, vibrant community making use of it, for establishing the ELG as the primary marketplace for LT. Clearly, the chosen goal is not an easy one and requires dedication from all stakeholders ranging from research to industry to policy makers. All of them are required in order to have a realistic chance of achieving the overall goal of the ELG.

1   Introduction

A key challenge to which the European Language Grid aims to respond is the ubiquitous fragmentation of the European LT scene, both with regard to industry and research. The ELG will address this problem by bringing together all players, currently scattered all over Europe, under a common umbrella platform.

1.1   Purpose of this document and Relations to other Deliverables

The ELG marketplace is one of the core elements of the ELG platform. This deliverable describes the marketplace and the accompanying strategy to establish and drive it. Furthermore, it describes aspects of innovation which provide the link between the creation of state-of-the-art technologies and services and their adoption to real-world use and the solving of customers' needs and problems. As will be detailed below, various levels of strategies are connected within the ELG. These comprise the marketplace, innovation, sustainability and communication all of which cannot be viewed in isolation but rather are intimately connected and need to be considered in a holistic and comprehensive manner. The following deliverables are not only temporally sequenced but more than this they are logically interlinked, containing central elements for later deliverables (Figure 1).
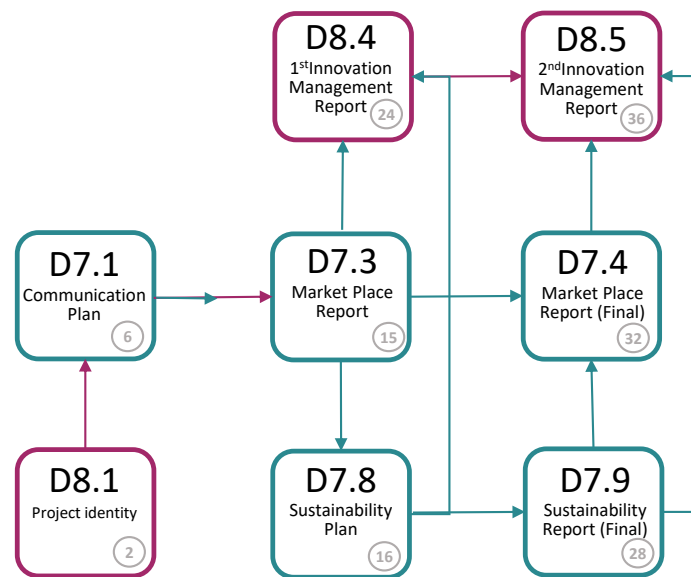
Figure 1: Overview of Deliverables and Interdependencies

1.2 About this Deliverable

This deliverable contains the core strategies of the ELG platform, connecting various levels of strategies within the project. However, marketplaces are dynamic. As such, this deliverable needs to be updated continuously, feeding back the information from the market participants and community, and integrating new insights on a recurring basis. Therefore, all current developments will be reflected in the final marketplace report (D7.4) in month 32, prior to the planned going-to-market of the ELG platform.

The document is structured as follows: after a brief introduction into the background studies and motivation for this report, market data sorted by their relevance for the ELG marketplace are explained (Chapter 1). Following, Chapter 2 which is the main part of this report, describes in great detail the ELG Marketplace, its foundation and its strategic and technical importance for Europe. Moreover, the marketplace and innovation strategy for the ELG is defined, comprising major steps, key elements and recommendations for its implementation and success monitoring. This part also highlights activities and key instruments for success which are seen important to make the way towards the "Primary Platform for LT in Europe" a true success. The summary and outlook including next steps conclude this document (Chapter 3).

1.2.1 Prior Studies (Background)

This report is based on substantial knowledge generated by previous research, studies and reports which is included here as background, such as the final study report on CEF Automated Translation[1], the work and field

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[1] Vasiljevs, A., Choukri, K., Meertens, L., and Aguzzi, S. (2019). Final study report on CEF Automated translation value proposition in the context of the European LT market/ecosystem. DOI 10.2759/142151. A study prepared for the European Commission, DG Communications Networks, Content & Technology by Crosslang.

studies done prior to and within the ELG project[2,3,4,5] as well as work done by LT-Innovate[6,7]. There are major findings which all studies have in common: The LT market is growing significantly and AI will increasingly be an integral driver of this growth – LT forms an integral part of AI itself in the sense that LT is often at the core of AI. This makes strategic alignments and alliances with activities in the AI sector a crucial factor for ELG. Market participants (supply and demand-side) are positive when looking towards the future and expect the LT market to grow substantially – horizontally and vertically.

There are three exceptionally promising verticals according to the studies analysed, namely the global market for LT in healthcare and life sciences with growth rates of up to 20.8% (until 2021), and the manufacturing industry and the government sector (especially defence and security) with around 10% each. It should be noted that while this deliverable was being written the COVID-19 crisis was still unfolding and its effects could not possibly be foreseen. On the other hand, every challenge and change also means a new chance: new markets and demands will evolve, with some sectors of the economy being even more dependent on (linguistic) AI and on LT than ever before.

Growth in the LT field continues to be driven by the AI revolution. The AI platforms market, where applications ranging from chatbots and conversational interfaces (these are, strictly speaking, LT) to predictive and prescriptive applications are being developed, grows at a rapid rate and involves billion-dollar enterprises, SMEs as well as start-ups from around the world. This creates chances and opportunities for European LT providers.

While the outlook for stand-alone LT application remains stable, the integration of LT into existing applications to streamline business processes, increase efficiency and cut costs provide increasing opportunities. Potential clients more and more look for a one-stop-shop provider and system integrator, rather than multiple single technology vendors. This need can be met by aiming to provide a more holistic suite of functionality for enterprise and commercial customers.

LT providers should therefore actively look for opportunities to add a full stack of capabilities to their portfolio, including not only NLP, but also other sub-fields of AI such as vision (object, face, logo and pattern recognition), voice biometrics, deep learning, big data analytics and predictive analytics.

A major opportunity for LT providers lies within the advertisement market. Matching online behaviour with interests of internet users across their devices and possible product advertisements while adhering to strict new privacy and data protection regulations will prove a very rewarding challenge. According to IMARC group, the global advertisement market will reach $769.9 billion by 2024, strengthened by the proliferation of digital media[8]. Data created by individuals through multiple devices creates opportunities to better understand their

[2] Rehm, G. and Hegele, S. (2018). Language Technology for Multilingual Europe: An Analysis of a Large-Scale Survey regarding Challenges, Demands, Gaps and Needs. Proceedings of the 11th Language Resources and Evaluation Conference (LREC 2018).
[3] Rehm et al. (2020). The European Language Technology Landscape in 2020: Language-Centric and Human-Centric AI for Cross-Cultural Communication in Multilingual Europe. Proceedings of the 12th Language Resources and Evaluation Conference (LREC 2020).
[4] Melnika, J., Lagzdiņš, A., Siliņš, U., Skadins, R., and Vasiļjevs, A. (2019). Requirements and Design Guidelines, June. ELG Deliverable D3.1. ELG: European Language Grid.
[5] Rehm, G., editor. (2017) Language Technologies for Multilingual Europe: Towards a Human Language Project. Strategic Research and Innovation Agenda. CRACKER and Cracking the Language Barrier federation, 12 2017. Version 1.0. Unveiled at META-FORUM 2017 in Brussels, Belgium, on November 13/14, 2017. Prepared by the Cracking the Language Barrier federation, supported by the EU-funded project CRACKER.
[6] LT-Innovate (2016): Assessment of the State of Language Technologies and EU Policy Recommendations
[7] LT-Innovate (2017): A Mission for Europe: Empowering a Multilingual Continent – Game Changing Technologies for Language Equality
[8] https://www.imarcgroup.com/global-advertising-market-grew-at-a-cagr-of-4-during-the-last-five-years

preferences as consumers and their political views. This enables enterprises to develop strategies to address them on an individual basis. LT can build the tools to leverage customers data assets to gain a competitive advantage, and to offer differentiated and custom-tailored products and services. Dynamic and self-learning LT will provide the flexibility required to meet market needs.

LT is a powerful enabler of economic growth allowing small and large European businesses to find new geographical markets. European companies also need efficient multilingual capabilities to break into linguistically challenging global markets. Therefore, it is of high importance for Europe to develop its own language technologies in order to avoid dependence on foreign vendors.

1.2.2 Motivation for and Scope of this Deliverable

The main motivation of this deliverable is to propose possible ways and strategies how to create the ELG marketplace which aims at accelerating the convergence of the European LT ecosystem while intensifying the cooperation between industry and research by boosting their ability to support the economy with language-savvy products and services of European and global scale.

1.2.3 Clarification of Key Terminology

1.2.3.1 Communication, Dissemination, Exploitation

The differentiation between the terms "communication, dissemination and exploitation" is important as it allows for the designing of plans, strategies and the timing of communication actions when it comes to the translation of research outcomes to society (Figure 2)[9].

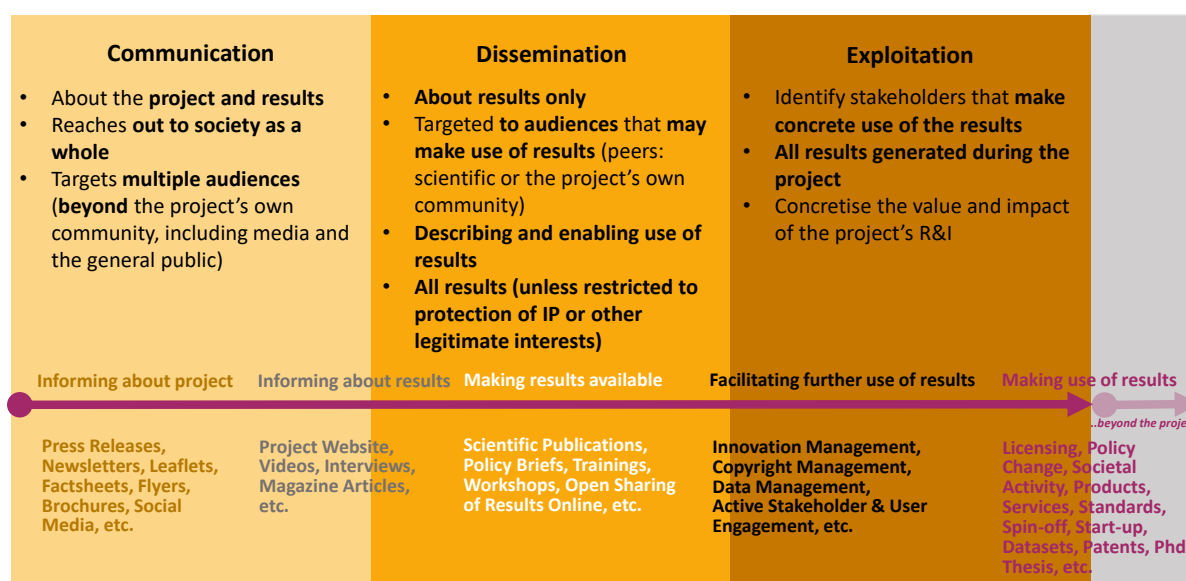Figure 2: Difference between Communication, Dissemination and Exploitation

These key terms are defined by Articles 38, 28 and 29 in the Horizon 2020 Annotated Model Grant Agreement[10] and are summarized below:

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[9] SC2 Coordinators day 06/06/2019, Maria Jose Amaral, Research Executive Agency, Unit REA.B2
[10] https://ec.europa.eu/research/participants/data/ref/h2020/grants_manual/amga/h2020-amga_en.pdf

- Communication: Article 38 stipulates that there is an obligation to promote the action and its results. "Promoting the action' means providing targeted information to multiple audiences (including the media and the public), in a strategic and effective manner and possibly engaging in a two-way exchange…" More precisely, communication is about the project and results.

- Dissemination: According to Article 29 there is an obligation to disseminate results. It means to "…disseminate project results by disclosing them to the public by appropriate means…" in other words, dissemination is about results only.

- Exploitation: Article 28 establishes an obligation to exploit results. This means that measures must be taken that ensure the exploitation of results. The focal point is here to "make use of the results" which can be done by a whole spectrum of activities ranging from using results in further research activities to developing, creating or marketing a product or service.

1.2.3.2   Innovation

The term innovation can be defined in a multitude of ways depending on the scientific discipline and the context used. In the context of the Horizon 2020 programme, innovation and the management of it is closely linked to communication, dissemination and exploitation and impact (Figure 2). Innovation Management as defined by the EC is the "… overall management of all activities related to understanding needs, with the objective of successfully identifying new ideas, and managing them, in order to develop new products and services which satisfy these needs. Innovation management starts at the point of capturing the creative works and finishes when a product or service is deployed[11]." This aspect of understanding needs is very important as it puts the user at the core of innovation and will be the common thread running through the entire innovation strategy (see in more detail in Section 2.4.).

1.3   The European LT Market

In order to properly locate the ELG within the European LT landscape, the state of the LT market, gaps in the existing landscape, risks and possibilities need to be determined. The following section outlines the state-of affairs regarding various aspects of the European LT market. These present the context within which the ELG marketplace will need to be established.

1.3.1   Market size and forecast

Obtaining accurate and reliable information regarding market size and revenue of the European LT market has proven difficult. Therefore, it is necessary to extrapolate projections and estimates from the global market and then apply them to the European market.

Data on LT in general is scarce, even on a global level. LT is undoubtedly a vital part of Artificial Intelligence. Market data and forecasts on the Global Artificial Intelligence (AI) markets are easier to come by. The agency

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[11] https://www.iprhelpdesk.eu/sites/default/files/newsdocuments/07%20Managing%20Impact%20and%20Innovation%20in%20H2020%20projects.pdf

Markets and Markets valued the global AI Market at $21.46 billion in 2018, expecting a CAGR of 36.62%, putting the estimates at around $190.61 billion by 2025.[12]

The market intelligence firm Tractica forecasts that global software, hardware, and services spending on NLP will reach $43.3 billion by 2025.[13]

According to a report from Fortune Business Insights, the global NLP Market is projected to reach $80.68 billion by 2026 with a CAGR of 32.4%.[14] More conservative forecasts estimate a CAGR of 21.0% from $10.2 billion in 2019 to $26.4 billion by 2024.[15]
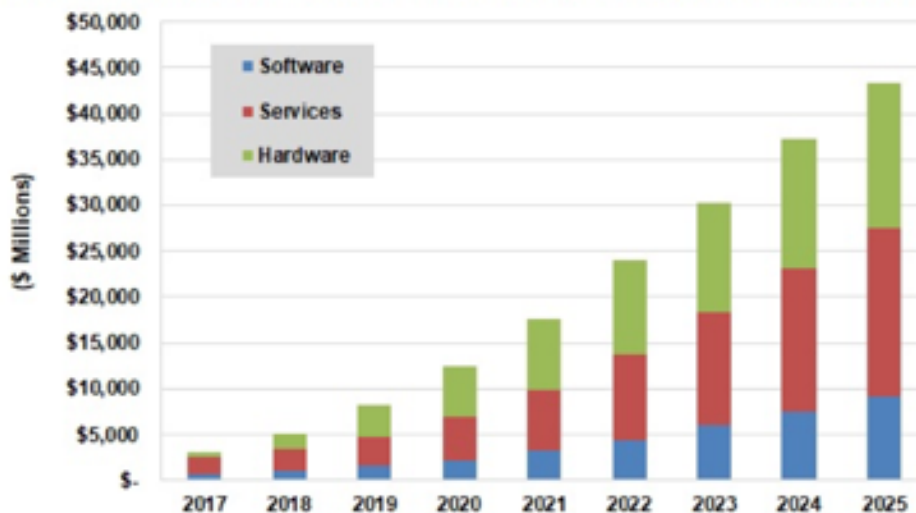
Figure 3: NLP total Revenue by Segment, World Markets (2017-2025)[16]

Taking into consideration the above forecasts, the share of NLP technologies within the field of AI can be assumed between 13% and 42%, depending on the estimates. Considering a conservative 25%, this puts the global NLP market at about $47.5 billion. Assuming that the European LT market amounts to about 30% of the global market, this leaves the estimated market size by 2025 at about $14.25 billion. This is broadly in line with LT-Innovate's empiric market estimate of 10€ billion for 2020. In addition, LT-Innovate estimates that the LT market currently drives a language services market in the region of 50€ billion and a huge and rapidly growing language applications market in many demand side segments.

This is significantly higher than the estimates by IDC[17], that forecast the LT market size in the EU28 (plus Norway and Iceland) at €1.04 billion in 2021 at a CAGR of 9.8%[18]. Comparing this with the above forecasts, this number is most likely an understatement by a factor of ten.

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[12] https://www.marketsandmarkets.com/Market-Reports/artificial-intelligence-market-74851580.html
[13] https://tractica.omdia.com/newsroom/press-releases/natural-language-processing-is-a-key-engine-of-ai-market-growth-enabling-44-discrete-use-cases-across-17-industries/
[14] https://www.fortunebusinessinsights.com/industry-reports/natural-language-processing-nlp-market-101933
[15] https://www.marketsandmarkets.com/Market-Reports/natural-language-processing-nlp-825.html
[16] Source: https://tractica.omdia.com/wp-content/uploads/2019/02/NLP-18-chart.jpg
[17] http://www.idc.com
[18] Vasiljevs, A., Choukri, K., Meertens, L., and Aguzzi, S. (2019). Final study report on CEF Automated translation value proposition in the context of the European LT market/ecosystem. DOI 10.2759/142151. A study prepared for the European Commission, DG Communications Networks, Content & Technology by Crosslang.

All the market estimates above may, of course, be negatively impacted by any long-lasting consequences of the COVID-19 crisis which is currently unfolding. On the other hand, every change means a chance: new markets and demands may evolve, with some sectors of the economy being even more dependent on (language-centric) AI than ever before (e.g., healthcare and pharmaceutical).

Independently of their market size, language and language-centric AI are core technologies that determine our control of the digital life of our languages and are sine-qua-non competences safeguarding our technological sovereignty. Not investing into them will ultimately result in handing control over the digital well-being of our languages (and our language-segmented content markets) to a few giant enterprises from other continents.
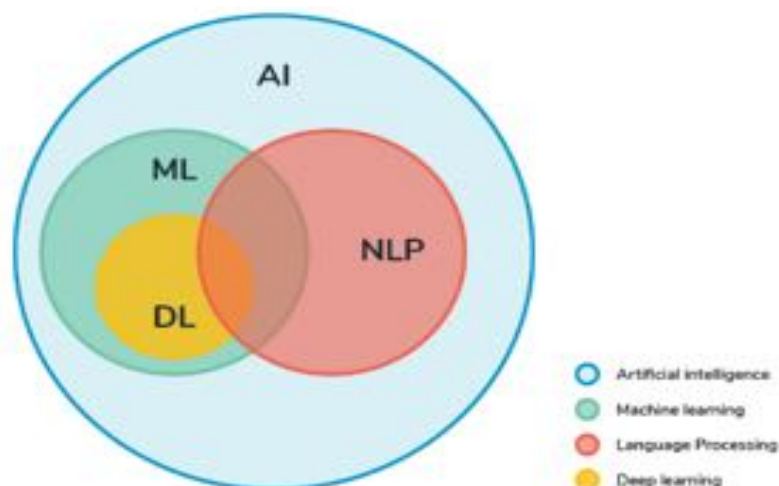
Figure 4: Interdependencies between AI, ML, DL and NLP[19]

LT, which is very often synonymously used with NLP is a vital part of AI. The interdependencies between AI, ML, DL and NLP are depicted in Figure 4. The technological revolution in AI will remain the main driver of growth for LT. On the other hand, NLP and AI are interlinked as Language Intelligence is a driving force behind AI (because it enables machines to communicate with humans).

Further growth factors are the high demand of process automation in industry, Internet of Things (IoT) in consumer goods, as well as vast applications for the service economy. Predictive applications, as well as decision making and decision support applications with use cases in military, health and business also heavily rely on LT.

1.3.2   Demand Side

There are several vertical markets that LT providers are serving. Taking the example of speech recognition, the underlying technology used for different verticals may very well be the same. However, the vocabulary used in the fields of media, medicine or law varies quite a lot. Therefore, verticalization strategies are necessary as differences in many sectors should not be underestimated. Entry barriers into other verticals remain high and ought to be analysed thoroughly.

From a vertical market perspective, the most important sectors for LT vendors are government, defence and security, healthcare, media, banking, manufacturing, transport and logistics. Described in more detail below

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[19] https://becominghuman.ai/alternative-nlp-method-9f94165802ed

are the verticals that are expected to exhibit the highest growth rates and biggest potential from a LT provider's perspective.

The *government sector*, including defence applications, is one of the biggest markets for language technology. IDC[20] expects that language technologies spending in the public sector accounts for €97 million in 2018 and is expected to grow to €126 million by 2021, showing a CAGR of 9.3% [21]. The government sector might not be the fastest growing vertical, however, it is a large and stable customer base for LT providers.

Figure 5: Important Issues across Government Domains Addressed by NLP[22]

Government agencies are drowning in data that is generally unstructured and unused. LT can free the potential of data being "trapped" in physical or virtual file cabinets.[23] Making use of LT can greatly improve the government's ability to "connect the dots" and identify patterns in previously neglected data.

Many law enforcement and intelligence agencies across the world are working with applications based on NLP, ML, AI and Big Data Analytics to gain actionable intelligence. Tremendous growth potential lies within the realm of predictive analytics and decision support. Further applications are in the counter-terrorism and homeland security sphere. Early detection for radicalization, by analysing the way language is used by young people online, can be aiding a broader counter-radicalisation strategy.

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[20] http://www.idc.com
[21] Vasiljevs, A., Choukri, K., Meertens, L., and Aguzzi, S. (2019). Final study report on CEF Automate translation value proposition in the context of the European LT market/ecosystem. DOI 10.2759/142151. A study prepared for the European Commission, DG Communications Networks, Content & Technology by Crosslang.
[22] https://www2.deloitte.com/us/en/insights/focus/cognitive-technologies/natural-language-processing-examples-in-government-data.html
[23] https://www2.deloitte.com/us/en/insights/focus/cognitive-technologies/natural-language-processing-examples-in-government-data.html

Another very promising market is the *healthcare industry*, accounts for spendings of over €26 million in 2018 and is expected to grow to €34 million by 2021, showing a 2016-2021 CAGR of 9.8%.[24] The agency *MarketsandMarkets* suggest that the global market for NLP in healthcare and life sciences is estimated to grow from $1.032 billion in 2016 to $2.650 billion by 2021, with a CAGR of 20.8% during the forecast period.[25]

AI is set to revolutionize especially the healthcare industry. AI can help to automatically detect tumours and anomalies through image, object and pattern recognition. LT can instantly support doctors with the newest medical journals, articles and treatment suggestions. Furthermore, LT could automatically generate information custom-tailored to the patient's medical history, diagnosis and lifestyle.

A very promising market in terms of language technologies spending is the *manufacturing industry* which accounts for €186 million in 2018 and is expected to grow to €252 million by 2021, showing a 2016-2021 CAGR of 10.4%[26] This vertical exhibits the highest CAGR amongst the verticals analysed by IDC[27].

The most promising use cases for LTapplications in manufacturing involve the analysis of operational data, as well as digital documentation. Analysed data might uncover hidden potential to increase efficiency and further automate manufacturing processes.

Language barriers are a significant issue for international global supply chains and logistics execution. LT helps to manage this by allowing local stakeholders to communicate in their native language. An example is the Grab taxi application that allows the user to chat to drivers in their native language and vice versa, while the application instantly translates it.[28]

Another LT application in manufacturing includes the use of chatbots to request and make available information. Suppliers, customers or other stakeholders ask questions and LT applications can responds with the right information or guide them to the appropriate section on the website. This can drastically reduce overhead costs in customer service centres and improve customer satisfaction all throughout the supply chain.[29]

1.3.3 Supply Side

LT is not a straightforward software category. It represents an unusually broad ecosystem that operates in a variety of product and service sectors, from core technology deeply embedded in complex enterprise systems, to sophisticated consumer gizmos and industrial robotics.[30] The following key technologies can be identified:

1. Natural language understanding (NLU) technologies (e.g., virtual assistants, chatbots, and question answering systems)
2. Translation technologies including machine translation (MT), translation memory (TM) and translation management systems (TMS);

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[24] Vasiljevs, A., Choukri, K., Meertens, L., and Aguzzi, S. (2019). Final study report on CEF Automate translation value proposition in the context of the European LT market/ecosystem. DOI 10.2759/142151. A study prepared for the European Commission, DG Communications Networks, Content & Technology by Crosslang., p.62

[25] https://www.marketsandmarkets.com/Market-Reports/healthcare-lifesciences-nlp-market-131821021.html

[26] Vasiljevs, A., Choukri, K., Meertens, L., and Aguzzi, S. (2019). Final study report on CEF Automate translation value proposition in the context of the European LT market/ecosystem. DOI 10.2759/142151. A study prepared for the European Commission, DG Communications Networks, Content & Technology by Crosslang.

[27] http://www.idc.com

[28] https://www.blumeglobal.com/learning/natural-language-processing/

[29] https://www.blumeglobal.com/learning/natural-language-processing/

[30] LT-Innovate (2013), LT2013 Status and Potential of the European Language Technology Markets, p.11

3. Speech technologies including automatic speech recognition (ASR) and speech synthesis (text-to-speech or TTS), interactive voice recognition (IVR);

4. Analytics including information retrieval (IR) text analytics, sentiment/opinion analysis, topic modelling, decision support systems);

5. Search systems (enterprise search, multilingual and semantic search);

6. Speaker identification, voice biometrics, audio event detection

7. Summarization

With regard to the languages for which LT services are provided, English, German, French, Spanish Italian and Portuguese as well as the languages of Europe's main trade partners (Chinese, Russian, Arabic, Korean) are of greatest importance to the vendors. European LT vendors generally focus more on offering products and services for niche markets, to differentiate themselves from US multi-national vendors.

1.3.4 Market Players and Competitive Landscape

According to LT-Innovate there are about 500 companies in Europe either actively developing LT, or embedding its features in their products and services. 25% of companies are micro enterprises with fewer than 10 employees, while only 6% have more than 200 employees; almost the entire industry consists of SMEs[31].

Many European LT companies have gained access to markets by being acquired by larger US-based companies. Especially in language services, big enterprises can address global clients by acquiring smaller entities and then consolidating their technologies. By snapping up a range of translation tools they created the technology-based translation industry we know today, an innovation dynamic that was driven mainly from European industry.

This consolidation in the industry in principle is healthy, as it moves LT up the "food chain" into mainstream applications and markets. However, it does not promote the evolution of a strong and self-sustaining LT industry across Europe. The patchy language coverage of solutions in the speech and content markets serves as evidence that this is a key constraining factor in Europe's share of those segments of the market.

Research by IDC shows that the market is dominated by US (and, more recently, Chinese) multinational companies, which play a major role in Europe. Indigenous vendors are predominantly niche players serving local markets, among these the largest vendor is SDL with annual European LT revenues of €13M.

As far as regional competition is concerned, a few European LT vendors are scaling their operations above national level (e.g., Acapela, Almawave, Artificial Solutions, Bertin IT, Expert System, Kilgray/MemoQ, Linguamatics, MeaningCloud, Memsource, Ontotext, Sail Labs, SYSTRAN, Unbabel, VoiceInteraction, Wordbee, XTM International). Still, many local companies with expertise in the local languages serve mostly local markets.[32] As global cloud-based language-enabled services are launched on a broad scale across the world, this scale-up process and collaboration (if not convergence) should be encouraged throughout Europe[33].

The "Final study report on CEF Automated Translation value proposition in the context of the European LT market/ecosystem" has identified seven dimensions to compare the European, Asian and North American markets:

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[31] LT-Innovate (2013), LT2013 Status and Potential of the European Language Technology Markets, p.27
[32] LT-Innovate (2016), Assessment Of The State Of The Eu Language Technology Sector And Eu Policy Recommendations
[33] Wacker, Ph., Empowering a Multilingual Continent with Language Intelligence, 2020

- Research
- Innovations
- Investments
- Market dominance
- Industry
- Infrastructure
- Open data

In sum, the general notion is that LT providers are optimistic about the future of the market. The LT market is growing significantly and likely to continue to thrive over the next five years. One major growth factor seems to be AI: The AI software platforms market, where applications ranging from chatbots and conversational interfaces to predictive and prescriptive applications are being developed, continues to grow at a rapid rate, involving billion-dollar enterprises, SMEs as well as start-ups around the world. This brings about chances and opportunities for European LT providers.[34]

2 The ELG Marketplace

2.1 Introduction

In order to understand the possible foundations and mechanisms of the future ELG marketplace it is crucial to explain the characteristics of platform businesses. Platforms are typically described as *multi-sided marketplaces*, where value is created for all members of the network[35]. They can be classified into[36]:

Transaction platforms promote exchange or transactions between multiple users, buyers or suppliers and act like a medium or conduit.

Innovation platforms consist of technological building blocks used as a foundation on top of which other innovators can develop complementary technologies, services or products. One key feature is the possibility to tap into a potentially unlimited pool of external innovators[37]. One example is the iPhone which has thousands of apps developed by innovators using Apple technology which the company makes available through its API.

Integrated platforms are a technology, product or service that combine aspects of both, transaction and innovation platforms in one. This category includes companies such as Apple with its App Store platform and a big outsourced ecological system of developers supporting the creation of content and innovation.

Investment platforms act as a holding company for a portfolio, a platform investor or both. The strategy behind this is to build a portfolio of companies in underserved or untapped markets through regional investments. For example, the Priceline Group has a portfolio of companies such as Booking.com, Priceline.com, Kayak.com, rentalcars.com, and OpenTable.

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[34] Vasiljevs, A., Choukri, K., Meertens, L., and Aguzzi, S. (2019). Final study report on CEF Automate translation value proposition in the context of the European LT market/ecosystem. DOI 10.2759/142151. A study prepared for the European Commission, DG Communications Networks, Content & Technology by Crosslang, p.52
[35] Still, K.; Seppänen, M., Korhonen, H., Valkokari, K., Suominen, A., Kumpulainen, M. (2017). Business Model Innovation of Startups Developing Multisided Digital Platforms.
[36] Gawer, A. and Evans, P., (2016): The Rise of the Platform Enterprise.
[37] See the section on innovation relating to this setup which can be described as *open innovation*

The landscape of these different types of platforms in the global market space presents itself as follows.

There are about *160 transaction platforms* in the market with a total market cap of $1.1 trillion. Interestingly, type is dominated by mostly private companies. Prominent examples are Airbnb, Uber, eBay or Taobao. Compared to the other three types, the transaction platform exhibits higher competition and is more fragmented.

There are five giant companies that make up the *innovation category*, which have a total market cap of $911 billion (Microsoft, Oracle, Intel, SAP, Salesforce).

The *integrated platform* companies – Google, Apple, Amazon, Facebook, Alibaba and Xiao MI – have a market cap of $2 trillion. They combine aspects of transaction platforms (they facilitate double-sided markets) and innovation platforms in that they govern third-party developer networks and innovators. Amazon and Alibaba for example, have multiple platforms in their portfolios and are therefore also platform conglomerates.

Five companies make up the investment platform category: Priceline Group (U.S.), Softbank (Japan), Naspers (South Africa), IAC Interactive (U.S.), Rocket Internet (Germany). These are not platforms in the narrow sense, because they act as holding companies for early stage investment into other platform companies.

2.1.1 The role of ELG
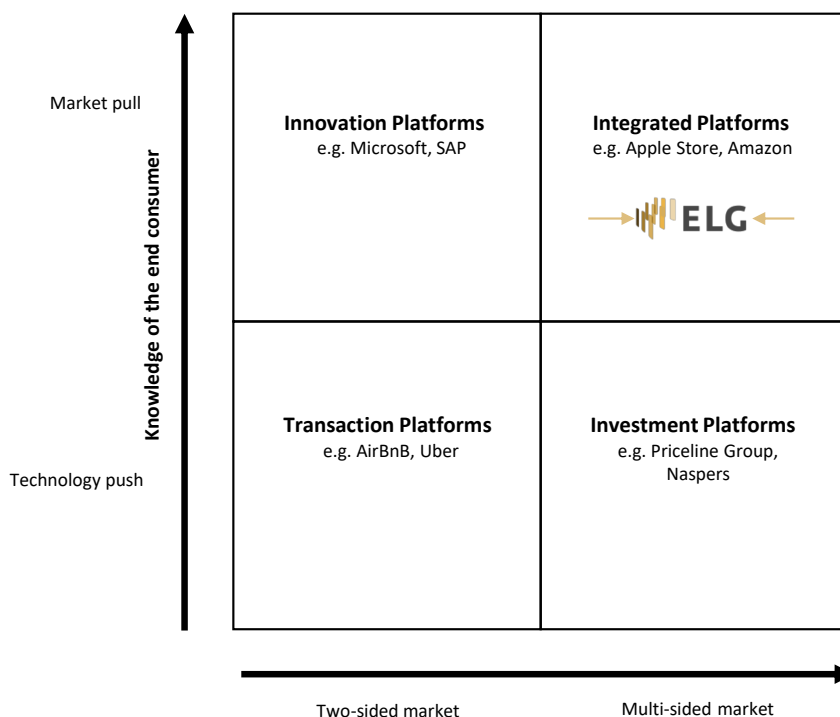
Figure 6: Platform Types and ELG Positioning

The goal of the project is to establish the ELG platform as *the primary marketplace for LT in Europe*. As such, the vision is to incorporate many aspects in one, namely the marketplace, business space and innovation aspect. More precisely, the marketplace will focus on commercial aspects, linking supply and demand, enabling reciprocal value exchange. In addition, the ELG will function as a virtual *agora*, bringing experts, end-users, requirements and capabilities together in one forum (business space) and as an innovation driver, by promoting open innovation and providing access to a potentially unlimited pool of innovators.

The ELG is envisioned as an **integrated platform type**. It has the ability to facilitate multi-sided value creation and business, efficient transactions coupled with large developer ecosystems that build innovative technologies and services in an open and agile manner. As such it will be guided by actual needs from potential customers creating a strong market-pull rather than technology-push approach to serve a multi-sided market (Figure 6).

The main goal is to provide a marketplace for European LT, which requires a broad geographical, linguistic, technological and sectorial representation within the platform of each of the marketplace participants (demand and supply-side).

2.1.2   Foundations of the Marketplace

Marketplaces enable providers and users to create value by interacting with each other. They make it easy and efficient for participants to get in touch and exchange and reduce the friction that makes it difficult for different sides of the market to connect. The value created increases even more for participants of multi-sided marketplaces. A key feature of multi-sided marketplaces is the network effect: a platform becomes more attractive to potential new users as more users engage with it. In other words, the value increases for all participants as more users actively use the platform (snowball effect).

The following qualities are envisioned to be of particular importance when designing the ELG marketplace:

Ability to Attract Participants

A must for the ELG marketplace is the ability to make a core interaction inevitable and to attract users. This "gravity", which is one of the most important ingredients for its success will be supported by a well-balanced interplay of supply and demand. It is vital for the marketplace to generate a market pull in order to fulfil the goals of self-sustainability. The more participants the ELG attracts, the greater the network effect and compound value growth will be. The technical foundation to guarantee that people are attracted to the ELG is an innovative and state-of-the-art solution for containerized LT components, services and resources coupled with cloud solutions to enable fast and efficient interaction and speedy and scalable innovation.

Ability to Create Demand Economies of Scale

The ELG will rely also on the so called "demand economies of scale", which take advantage of technological improvements on the demand side and are driven by demand *aggregation*, efficiencies in networks, and other phenomena (like crowd sourcing of software development) that make bigger networks more valuable to their users. Once the gravity of the marketplace is functioning, network effects will be the natural result. Growth via network effects lead to market expansion. New buyers enter the marketplace, attracted to the ELG by the growing number of partners who are part of the network.

Advantage of Reduced Time-to-Market

Strategically speaking, the ELG will also focus on reduced time-to-market objectives: the corporate strategy of the future marketplace will be designed to truly fulfil the role as accelerator for business creation and will consider concepts like "lean management" and "just-in-time" supply chain delivery.

Quality Standards

In order to be successful, the marketplace needs to facilitate the exchange of values which means that the components, services, resources provided through the ELG require certain quality standards. Of course, each

stakeholder has different needs, application purposes and quality standards which have to be met. Depending on the use cases and target groups, it is planned to underline this by an ELG standard and quality seal as well as through reviews of participants' prior transactions. It is envisioned that such standards will be implemented for services as well as for resources. In any case, the provision of high-quality state of the art LT, open architecture, reusable software, industry-grade robust components are planned and provide key ingredients for establishing confidence and trust into the ELG as a whole.

Ease of Doing Business

Furthermore, a proper organization and infrastructure have to be provided to guarantee "flow", i.e., the ELG platform smoothly fostering the exchange and creation of value and an ease of doing business. A prerequisite for this is an attractive, simple and transparent licensing and pricing model, and a simple business processing scheme. The ELG will be the single point of contact with the buyer entering into a single contract.

ELG Ecosystem

The overall goal setting and vision of the marketplace has to go well beyond the single entity perspective and will include the whole environment around it: the ELG will develop and sustain an "*ecosystem of participants*" with different roles – LT suppliers and demanders, academia, collaborators, policy makers and communities. The ELG will connect people, foster open and two-way communication, create mutually beneficial relation-ships, and promote community building. It will provide an umbrella platform for its participants enabling them to build relationships and to provide value to one another. Community building is needed in order to reach a critical mass of active participants and to generate a market pull (*gravity*).
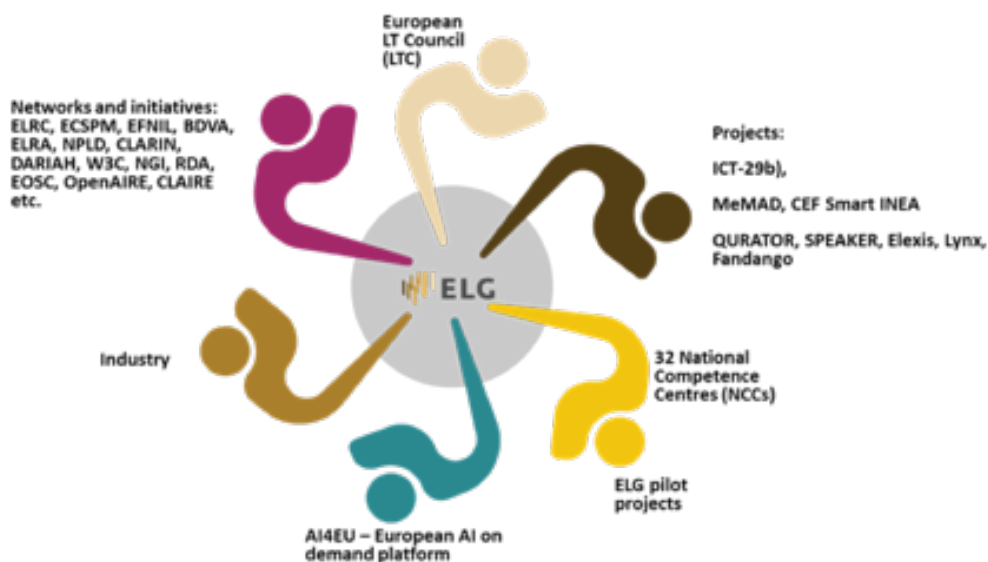
Figure 7: Ecosystem of ELG Participants[38]

From a commercial point of view the ELG will provide the infrastructure for an ecosystem of matching prod-ucts, services, providers (supply) and users (demand), with a multi-sided set-up. The role of this ecosystem is comparable to an *orchestrator*: bringing different stakeholders together to allow for an exchange of values. The

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[38] In this figure, only a selection of participants is shown.

ELG has to create an infrastructure for this matchmaking and set the interaction governance principles. By aligning itself with key associations and initiatives, the ELG will aim to establish itself as a central ingredient in a platform-of-platforms landscape. The ELG will be designed as a reciprocal value-exchange marketplace. As an umbrella platform shared by the whole European LT community, it will facilitate both, the reciprocal transactions of values and LT provider companies to grow and benefit from scaling. Thus, in order to be successful, the ELG platform will consider a whole spectrum of strategies from community building to business models, and approaches to value creation, value capture and value delivery.

2.2   Importance of the ELG Marketplace for Europe

To date, there is no general single digital platform for LT in Europe. This has several reasons: first, LT is primarily dominated by global IT giants such as Google, Microsoft, Facebook, Amazon and Apple. In addition, the LT market is very fragmented and very challenging to capture since Europe has very different backgrounds, needs and business models with regards to LT. The current landscape is dominated mainly by SMEs and a small number of large players which the ELG platform will unite under one umbrella. Furthermore, companies like Google, Microsoft, Facebook, Amazon and Apple are the most powerful platform businesses in the world, which are able to exploit – among other advantages – economies of scale and network effects for their colossal growth.

From a structural (platform) point of view, there are significant disparities between regions: a large and diverse group of platform companies are located in North America and increasingly Asia while Europe is significantly lagging behind. Whereas Europe was found to have 11 percent of the world's innovation platforms and a growing number of transaction platforms, it has *no integrated platforms* (Figure 8[39]).

This leads to questions about what favours the start-up and growth of platforms. Clearly, there are many factors involved such as the availability of technology, access to high demand and associated possibility of scaling. One of the most important factors determining growth especially supporting critical start-up phases, is the presence of sufficient funds: there is well-documented availability of venture capital in the US.

That does not mean that the platform business is not important to Europeans. If anything, platforms play a strategically important role in Europe's digital society and economy. According to the European Commission more than 1 million EU businesses are already selling goods and services via online platforms, and more than 50% of SMEs selling through online marketplaces sell cross-border[40].

The current situation in Europe with regards to this type of platform could mean a favourable market entry condition for the ELG as an *integrated platform* due to less competition in this field. The near future will show whether there will be any successful integrated platforms for LT entering and flourishing in Europe.

The importance for Europe has multiple aspects: first, the gap in the integrated platform market will be filled by developing and deploying the ELG as *the umbrella* platform for commercial and non-commercial LT. The ability to operate as an integrated platform means a competitive advantage in this field because it combines both, transaction and innovation platforms in one, enabling transactions between multiple users, buyers and suppliers and access to a potentially unlimited pool of innovators as well as to an ecosystem of partners.

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[39] Gawer, A. and Evans, P., (2016): The Rise of the Platform Enterprise.
[40] https://ec.europa.eu/digital-single-market/en/policies/online-platforms
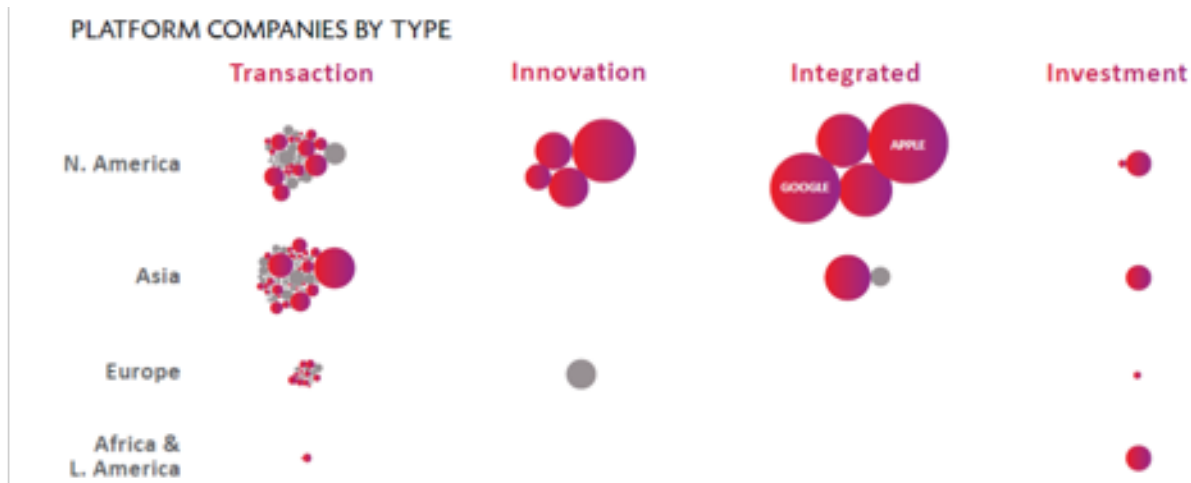
Figure 8: Regional Differences of Platform Companies by Type

Second, the ELG will be the first digital marketplace in Europe with a technology-enabled multilingual focus with regards to the LT offered. Multilingualism is one of the key cultural cornerstones of Europe, with 24 official languages and more than 60 regional and minority languages, all of which will be eventually covered.

The availability of a comprehensive platform will stimulate the European economy. Europe's LT landscape is mostly dominated by SMEs, which do not have the same economic power and resources to conquer new markets. Through the ELG SMEs will obtain access to markets they would otherwise not have been able to serve. They will be enabled to use and offer LT to expand their businesses online across many languages and various different verticals. Companies will be able to chain their products and services together with other European providers irrespective of where they come from. This will lead to a more complete product offering for both, LT providers and users and opens up new, additional market channels for all participants in the ELG.

In addition, the ELG extends the reach and enhances their visibility of commercial LT providers who want to showcase their portfolio of products and services. The necessary gravity for the marketplace is constantly generated by growing a strong, active and vibrant community around the ELG. The more active users, the greater will be the network effect and the higher the compound value for all.

The ELG will facilitate exchange between research and industry by bringing all participants together under one umbrella. It will function as an enabler of knowledge exchange and innovation, feeding back into the European LT industry. In turn, the industry will use this knowledge to realize a competitive advantage, by better understanding the markets' needs while keeping an eye on further innovation.

Through its contribution to the Multilingual Digital Single Market as *the* umbrella platform for LT the ELG will promote the growth of the European LT market, creating new jobs, market opportunities and be a driver for open innovation.

2.2.1 Strategic Aspects

As mentioned above, the current European LT market is very fragmented. It is mainly organized according to geographical regions, with very similar companies operating in different countries without ever collaborating, merging or joining forces within a single market. Fragmentation is also due to the silo-like nature of technology domains. For example, the translation market members very rarely collaborate with other technology players in speech or NLP to find out how they can better meet their customers' content localisation needs or to invent

new types of solutions for local languages. Many small technology vendors focus on local languages, serving local markets with services in their own languages. Nowadays this is not sufficient as cloud-based language-enabled services are emerging on a large scale, many driven by huge international companies who have the financial power to acquire small European LT companies and to absorb knowledge and expertise. This development has led to the fact that innovation in LT industry is largely driven from outside Europe[41].

Dealing with fragmentation requires an overarching strategy for concentration and pooling. The main objective is to establish the ELG as the primary platform for LT in Europe to connect demand and supply and to strengthen European LT business with regards to the competition from other economic regions and continents. This will be achieved by developing and positioning the ELG as *the* platform for the highly fragmented European LT landscape and by growing a strong, active and vibrant community of users. In order to attract as many users as possible, efficient communication and community building is a must.

In addition, the networked structure of the ELG will enable feedback of market- and technology-relevant information to "siloed" vendors. It will be important to think in value chains and focus on the customers' needs rather than push technologies to the market (shift focus from supply-side to demand-side mind set). The ELG will enable LT vendors to offer vertically packaged LT solutions by a unique combination of components and services from the grid. The ability to extend LT capabilities vertically along the value chain by building on targeted geographic markets or languages could be a key differentiator for European LT market-participants and a determining factor for business success. Strategically relevant for Europe will be related topics of cloud and compute resources, storage, Big Data, data analytics, (the use of LT within) AI, anonymization of data and multilingualism. At the final stage the ELG will enable its participants to offer complementary technologies for targeted domains and geographic markets, fostering horizontal and vertical LT industry convergence.

2.2.2   Technical and Practical Aspects

Technically, the ELG will be the first large-scale LT platform applying containerization through Kubernetes. It is a scalable platform with a web user interface and corresponding backend components and REST APIs. It will provide access to various state-of-the-art technologies, services and components and will include an overarching LT directory of stakeholders from research, innovation and technology, i.e., it will comprise the "yellow pages" of European LT. From a marketplace perspective, ELG plans to attract a large number of providers and users from different geographies, fields and sectors of the economy.

On the provider side, ELG adheres to standards to enable the integration of a large number of disparate tools:

- Definition of common APIs for each type of tool, designed to be powerful enough to support the necessary use cases but lightweight and flexible enough to allow tools to expose their own specific parameters where this makes sense.
- Containerization to isolate tools from one another and allow each tool to manage its own software dependencies. The ELG platform uses Kubernetes to manage the deployment, scaling and execution of containers in combination with Knative to handle auto-scaling of containers (up and down).

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[41] LT-Innovate (2016): Assessment of the State of Language Technologies and EU Policy Recommendations

- Orchestration of services has not been addressed explicitly yet but is assumed to become an important topic as the set of offered services and LTs grows and the demand for complex workflows becomes visible. This may potentially even concern workflows spanning multiple platforms.

With regard to the user interface, standards in user friendliness are adopted and marketplace-related features, such as upload/download, licensing, billing, payment as well as compliancy rules (legal and GDPR related) will be adhered to.

2.2.3 ELG Exploitation Strategy

The project will promote the ELG as the primary platform for LT in Europe through multiple communication, dissemination and exploitation activities, including the organization of large annual ELG conferences, presentations, participation in tech expos and leveraging all networks and initiatives with the goal of attracting users and providers to the ELG. The focus of the overall exploitation strategy of the ELG as a platform will shift from internal to external activities: orchestrating external resources and creating vibrant communities. Therefore, the main aim of the overall exploitation strategy is to grow a strong, active and vibrant community around the ELG in order to generate a snowball effect, i.e., strong small wins that will together eventually start 'snowballing' into bigger wins and generate a compound growth for all participants. The exploitation of the project's results will take place on the ELG marketplace. The exploitable results will include tangible and intangible assets.

Tangible Assets:
• **The ELG platform itself. The ELG code will be open source.**
• **A large number of resources, models, tools, technologies (for all European languages)**
• **A catalogue to organise the grid content to be accessed through a web interface**
• **A catalogue containing individual entries for LT companies, research centres, different types of applications and services etc.**
• **A legal entity for the ELG will be established in 2021. Details will be devised in the sustainability plan.**
Intangible Assets:
• **Strong and extensive LT community and extensive network of key players in Europe**
• **Expertise and knowledge of best practises for platform set-up and usability**
• **A dissemination strategy, sustainability and operations plan for the ELG platform**

Table 1: Tangible and Intangible Assets of the ELG

2.2.4 Synergies with and Benefits from other European Initiatives

The ELG marketplace will leverage cross-sectoral opportunities, synergies with and innovation from other projects by accessing broader user and developer communities to the greatest possible extent.

All in all, we have identified more than 30 projects, platforms and initiatives that are relevant for ELG. They share at least one of the following goals with ELG: 1) they provide a collection of LT/NLP tools or data sets; 2) they provide a unified platform, which, underneath, harvests metadata records of data sets or services or tools from distributed sources; 3) they provide a sharing platform for the exchange of tools or data sets[42].

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[42] European Language Grid: An Overview (Rehm et al., 2020)

2.3 Marketplace Strategy

The following section describes the proposed strategy for the ELG marketplace with regards to its main objectives, set-up, key-elements, strategy implementation and finally the monitoring and refinement of the strategy. It should be noted that this is only a preliminary version of a strategic marketplace concept which will be updated continuously, with the goal to present the final version of the marketplace report in month 32 (D7.4).

2.3.1 Definition

A strategy is more than just a plan. Originally derived from the Greek word "strategos" (planning of destroying enemies by effectively using resources) the meaning of the concept has shifted its focus from the military to the business perspective as a concept of business strategy within a competitive environment. A strategy is concerned with formulating long-term goals and developing a guideline for decision making with regard to which actions need to be taken to achieve the pre-defined goals.

Why does this definition matter? First, one should not forget that a strategy is always related to "long-term goals" and is usually subject to certain resource restrictions (time, money, knowledge, staff, etc.). At this stage, it is particularly important for the ELG marketplace to start defining a proper long-term strategy in order to guarantee its sustainability after the project support has ended. In order to be able to link ELG strategic planning with operational execution, the following sequence of steps is proposed [43]:

1. Develop the Strategy
2. Translate the Strategy
3. Align the Organization
4. Plan Operations
5. Execute the strategy
6. Monitor and Learn
7. Adapt (update the strategy)

The first and most important step in this process is the development of a strategy which includes the definition of the main ELG marketplace objectives as well as the key elements that constitute this strategy. Steps 2 to 7 will be devised in detail with the final ELG marketplace strategy (as a legal entity as opposed to the project as outlined in the Innovation Matrix in section 2.4 below).

2.3.2 Marketplace Objectives and Comprehensive Approach

At the heart of every strategy is a vision. The vision of the ELG is to become the Primary Platform for LT in Europe. As such, the vision incorporates many aspects in one, namely the marketplace, business space and innovation aspect. More precisely, the marketplace will focus on commercial aspects, linking supply and demand, enabling reciprocal value exchange. In addition, the ELG will function as a business space and innovation platform, with the first being a "virtual agora" by bringing researchers, experts, end-users, requirements and capabilities together in one forum and the latter being a promoter for open innovation, having access to (external

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[43] Robert S. Kaplan (2010). Conceptual Foundations of the Balanced Scorecard, Harvard Business School, Harvard University

and internal) resources of innovation. The comprehensive approach will be guided primarily by the following principles:

Sustainability: From a financial point of view, the main aim is sustainability to be able to cover incurring costs on a long-term basis[44]. In order to achieve this goal a legal entity will be established in 2021, with several possible options: private company, non-profit organization, professional stakeholder association as well as European Economic Interest Grouping (EEIG).

Value Creation: The ELG aims to be a platform for value creation. This will be achieved by facilitating reciprocal exchanges between multiple participants via the marketplace. In addition, participants can create value by tapping into resources and capacities that they don't have to own. Furthermore, exchanges via the ELG will reduce transaction costs for each of the participants and enables access to externalized innovation.

Compound Growth: The ELG marketplace aims at providing its participants a broad base that enable compound growth and scaling. Growth will be mainly driven by network effects: new buyers and sellers enter the marketplace because they are attracted to the ELG by the growing number of participants who are part of the network.

Visibility: The ELG will be designed to enhance the visibility of each of its participants, extending their reach and networking power. From the LT-vendor perspective the main interest is to acquire customers. As an umbrella platform, ELG aims at removing geographic boundaries and language barriers, fostering the Digital Single Market.

Community building: A very important objective is to attract, grow and nurture a vibrant and active community around the ELG. A critical mass of active participants to generate a market pull.

The marketplace and innovation strategy together form the comprehensive ELG marketplace (Figure 9).

The objectives in the left part of Figure 9 represent the core transactions of the marketplace: these are concerned with creating (innovation) value, making connections between supply and demand, and with facilitating consumption and compensation of technologies, services, components and resources offered by the marketplace. "Connection" is a complex mechanism consisting of the elements portrayed on the right. Various kinds of connections are supported and promoted by the platform, from matchmaking, to matching of technologies, resources and services vertically and horizontally in order to provide a more comprehensive offering, to orchestrating all interactions between, users, providers and innovators, as well as nurturing a vibrant community.

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[44] Rehm et al. (2020). European Language Grid: An Overview
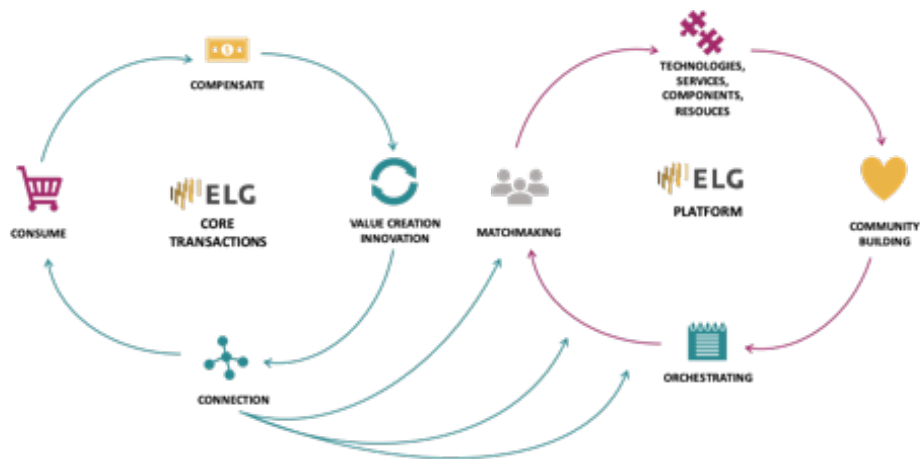
Figure 9: Comprehensive ELG Marketplace Approach

2.3.3 Key Elements of the Marketplace Strategy

The marketplace strategy will contain four crucial elements for success, each of which comprises further components. Figure 10 illustrates that all elements of the marketplace strategy are interlinked and will work together. However, "Connection, Gravity and Flow" are even more interconnected as they are the driving forces behind the creation of value and of innovation and the foundation for the business model. They are the three main building blocks for a future multi-sided ELG platform as they will facilitate the necessary framework (ELG as orchestrator) and infrastructure to achieve critical mass for transaction (both providers and users must be present!) and to stimulate a continuous flow of value by making connections: 1. Value, 2. The Business Model, 3. Innovation, 4. Connection, Gravity and Flow.

Figure 10: Key Elements of the ELG Marketplace Strategy

2.3.3.1 Value

The cornerstone of the marketplace positioning is the value that it adds onto its participants. The ELG will facilitate reciprocal value exchange by connecting LT-suppliers and demanders. As *the* European marketplace for LT it will connect previously unconnected supply-side and demand-side participants through innovative forms of

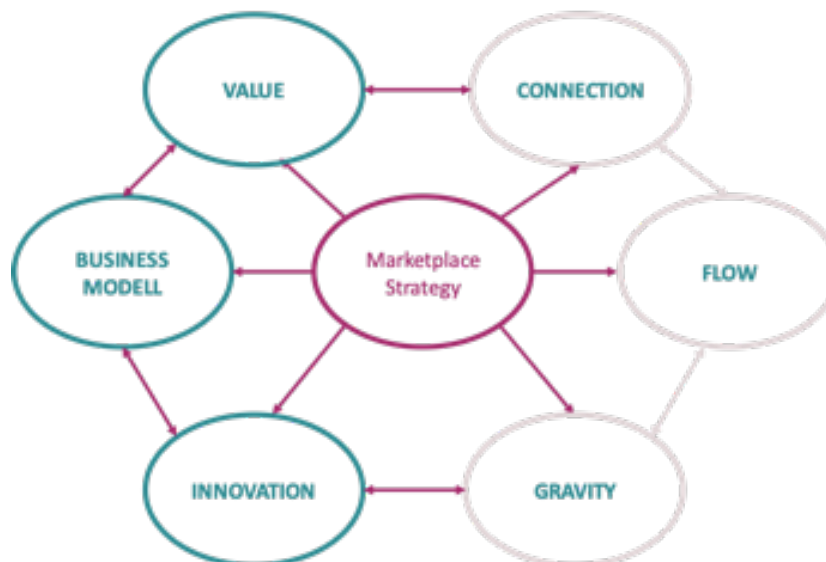value delivery, creation, and capture. Therefore, the marketplace strategy foresees that continuous innovation, the business model and value are interconnected with each other, providing reciprocal stimuli (Figure 10).

The value proposition depends on the components and service offered, their uniqueness, and the means of delivering the value to the target groups as well as right balance between the perceived value and the set price (i.e., the revenue model). Furthermore, ELG will be the orchestrator to ensure value creation and high quality of participation on the platform. As such, the unique positioning of the ELG as a marketplace will be based on the value generated and offered across verticals (Table 2). The grid below illustrates an example, a possible choice or portfolio of (non-exclusive) verticals and technologies, services and resources, requested by a customer. It serves to demonstrate that value creation can be achieved by aligning different technologies with different verticals thus capitalizing on synergy effects.

		VERTICALS				
TECHNOLOGIES, SERVICES, COMPONENTS		Health	E-commerce	Media	Banking and Finance	.....
Text-based	MT	🟡				
	Named Entity Detection					
	Text to Speech		🔴			
	Topic Detection					
	Summarization					
	Author Identification					
	Spelling and Grammar Checking		🔴			
Audio-based	Automated speech recognition / Speech-to-text	🟡	🔴	⚪		
	Speaker ID					
Multiple Modalities	Age and Gender Detection	🟡	🔴			
	Language ID					
	Sentiment Anaylsis		🔴			
Multiple-Technologies	Semantic Analysis					
	Smart Virtual Assistant		🔴			
	Knowledge graph					
	Online Terminology Services		🔴			
	Language Learning					
	Localization					
Resources	Resources and Data Sets					
	Service XYZ					
Services	Integration					
	Consulting					
	Trainings			⚪		

Table 2: ELG Value Creation across Verticals

For example, the yellow user receives a vertically packaged LT solution for his desired domain (health industry) in the form of a unique combination of components and services from the ELG. In addition, he or she can select the languages for the technologies, services and resources for his domain. Therefore, the ELG will offer LTs across many languages and various different verticals, covering complementary technologies, services and resources.

This builds up a three-dimensional marketplace strategy of value proposition combining all languages, technologies, services, resources with the domains demanded by the customer.
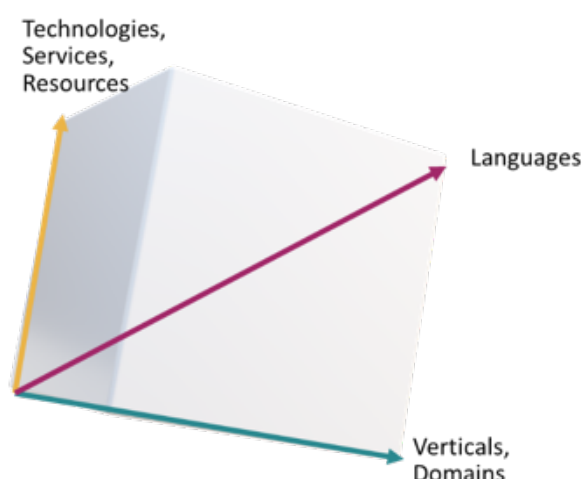

Figure 11: Three Dimensions of ELG Marketplace

2.3.3.2 Business Model

"A business model describes the rationale of how an organization creates, delivers, and captures value."[45] As such, the proposed business model may serve as a blueprint for the strategy to be implemented through organizational structures and future processes on which the ELG marketplace can be based. Therefore, the creation, delivery and capture of value will take a central position in the proposed business model. The ELG marketplace business model contains three basic dimensions: value creation, value delivery, and value capture.

Tables 3 to 5 give an overview of possible business model attributes and dimensions relevant for the design of the marketplace. These are based on a taxonomy for business models which characterizes most existing platforms[46]. The fields highlighted in pink indicate that some of the specifications are more probable for the ELG than others. This prioritisation is not meant to be preclusive. Rather it should be considered as an attempt for placing an initial focus for the ELG marketplace. Moreover, the tables contain some fields which are not highlighted or marked at all: a thorough decision process in relation to these attributes will follow within the coming months (with the final business model to be presented in Deliverable D7.4).

The first dimension, *value creation* refers to the ELG's architecture and mechanisms that allow for creating value. Here, options within different platform types range from offline to web-based platforms: at this stage, the ELG is planned to be a *web-based* platform. As such it will be responsible for the orchestration of key resources, activities and controlling of processes.

The ELG is intended to be a shared platform for the whole European LT community. As such, its "*key activity*" will be mainly concerned with active community building. The ELG community includes all stakeholders of the ELG such as such as LT providers, academic research organisations, LT customers, EC and institutions, public administrations, NGOs, policy makers, project consortia, research projects, as well as 32 National Competence Centres (NCCs) in 32 European countries, the European LT Council and the pilot projects.

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[45] Osterwalder, A., Pigneur, Y. (2010). Business model generation: a handbook for visionaries, game changers, and challengers
[46] Täuscher, K., Laudien, S. (2017). Uncovering the Nature of Platform-based Business Models: An Empirical Taxonomy

In addition to "platform type" and "key activity" there are two business model attributes which are crucial for marketplaces, namely *price discovery* and *review system*. Price discovery is important because the ELG marketplace has to set an acceptable price for their transaction participants which best matches their perceived value of the offer. The setting of prices will most probably be determined by the LT-providers (set by sellers) and/or fixed (pre-defined) prices (as opposed to auction or other platforms). According to the recent ELG user survey[47], two thirds of the respondents stated that they would be willing to pay for using the platform.

Furthermore, the ELG needs to create trust in order to be able to attract participants, transactions and promote exchange. Most marketplaces create trust by providing reviews of participants' prior transactions. Therefore, different options will be evaluated such as rating of selected components or services on an aggregate level, supplier ratings, and transparent technology readiness levels for some of the technologies offered.

	Business Model Attributes	Specifications				
Value creation dimension	Platform type	Web-based platform ●	Mobile app		Offline	
	Key activity	Data services	Community building ●		Content creation	
	Price discovery	Fixed prices ●	Set by sellers ●	Set by buyers	Auction	Negotiation
	Review system	User reviews	Review by marketplace		None	

Table 3: Key business Model Attributes of the ELG Marketplace (value creation)

The value delivery dimension captures attributes that deliver value (proposition) to the ELG platform participants (Table 4).

	Business Model Attributes	Specifications		
Value delivery dimension	Key value proposition	Price/Cost/ Efficiency ●	Emotional value	Social value
	Transaction content	Product ●		Service ●
	Transaction type	Digital ●		Offline
	Industry scope	Vertical ●		Horizontal ●
	Marketplace participants	C2C	B2C	B2B / other ●
	Geographic scope	Global	Regional ●	Local

Table 4: Key Business Model Attributes of the ELG Marketplace (value delivery)

For the ELG the value proposition will be mostly defined by the price-cost relationship as opposed to social values. Further value propositions include the ELG as the "one stop shop" (providing a comprehensive overview over services, tools, datasets), offering state-of-the-art products and services (fast, effective, robust, high quality). In addition, the emotional value proposition "made *in* Europe, *for* Europe" delivering technologies, services and resources compliant with European regulations fostering e-commerce business across Europe and contributing to the Digital Single Market. As far as the attributes transaction type and industry scope are concerned,

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[47] Melnika, J., Lagzdiņš, A., Siliņš, U., Skadins, R., and Vasiļjevs, A. (2019). Requirements and Design Guidelines, June. ELG Deliverable D3.1. ELG: European Language Grid.

the ELG will be largely delivering value in a digital way, with both vertical and horizontal market integration (depending on the technology, service and resources offered). The geographic focus will be first set on a regional (pan-European) level with further expansion to global markets.

A special focus should be placed on the marketplace participants, which are at the heart of any marketplace business model. The ELG intends to reach and serve different target groups, most importantly stakeholders such as LT providers, academic research organisations, LT customers, EC and institutions, public administrations, NGOs and policy makers. The ELG business model will be designed around a strong understanding of these specific target groups' needs. It will be considered to structure the marketplace according to separate target groups segments which either require and justify a distinct offer, different types of relationships or which are willing to pay for different aspects of the offer. Thus, from the marketplace participants' perspective, the main orientation will therefore be set on the "B2B and other" category, with "other" denoting universities, academic research organisations, EC and government institutions.

The third dimension "value capture" describes how the ELG plans to transform the value delivered to marketplace participants into revenues and profits. The general revenue stream options for marketplaces are commission model, subscription model, freemium, lead fee, featured listing, advertising model and service sales. For the ELG marketplace the most value capture dimensions are the following (Table 5):

Business Model Attributes	Specifications					
Key revenue stream	Service Sales	Commissions	Membership/ Sub-scriptions	Featured listings and ads	Freemium	Lead fee
Pricing mechanism	Fixed pricing		Market pricing		Differentiated pricing	
Price discrimination	Feature based		Location based	Quantity based	None / other	
Revenue source	Seller	Buyer	Third party	None	Other	

Table 5: Key Business Model Attributes of the ELG Marketplace (value capture)

There are many pros and cons for each of the different revenue models. For example, the biggest benefit of the commission model is that LT-providers are not charged anything before they get some value from the marketplace which makes participation really attractive. At the same time this model is lucrative for the marketplace because it gets a proportion of all the value that passes through it.

The typical value proposition for providers with a membership fee model is that the platform helps them find new customers. For customers, the benefit is to save costs or the unique experience. The listing fee/classified ads model is one where the marketplace charges a fee from providers when they post new listings. The problem is that the marketplace needs to guarantee lots of visibility for those listings (which can be problematic in the start-up phase).

A fixed pricing model for the marketplace with feature and/or quantity-based price discrimination is a probable alternative. Of course, other pricing models introduced by the LT-providers are also possible. Table 5 depicts several of the possible further value capture dimensions to be explored.

It should be noted that a business model canvas will be included in the ELG sustainability plan (Deliverables D7.8 and D7.9) which represents a further step in the development of the ELG marketplace business model.

2.3.3.3   Innovation

One of the most important foundations of the comprehensive marketplace strategy of the ELG is concerned with continuous, open innovation (briefly described in Section 2.4 and later elaborated in D8.4).

Within the marketplace strategy an additional business focus has to be set on innovation which is concerned with business model innovation. This type of innovation is mainly concerned with the following three dimensions: Value creation innovation, value proposition innovation and value capture innovation.

Value creation innovation: The ELG will create added value by "producing" new technological resources and capabilities with the help of intra- and interorganizational processes and innovators. The whole technical architecture of the ELG is built upon robust, scalable, reliable and widely used technologies and frameworks that are constantly developed further, e.g., Kubernetes, Docker, Django, Spring Boot and AngularJS, enabling innovators and other participants to easy plug into the platform to share, transact and connect. New Partnerships (with LT-providers, community, open call projects, etc.) represent the external resources that are available to the ELG in order to innovate the business model.

Value proposition innovation: ELG will use a three-dimensional marketplace strategy of value proposition combining languages, technologies, services, resources and domains to better solve the stakeholders' problems or satisfy their needs in new ways. For example, the ELG will offer the ability to chain resources, technologies and services together irrespective of where they come from (ASR from Vienna, and MT from France, in Spanish). As *the* umbrella platform for LT in Europe[48], the ELG will spur compound growth of its SME participants, opening up new market possibilities for them, reducing entry barriers (lower costs per participant) and increasing their visibilities. This will have a positive impact on the Multilingual Digital Single Market.

Value capture innovation: The value capture explains how value propositions of the ELG are converted into revenues. A new revenue model, including flexible and transparent pricing models (e.g., commission, subscription fee, ads, etc.) and one single point of contact will be developed (one contracting partner, one-stop shop, providing convenience and efficiency to clients, gaining loyalty as well as revenue). The aim is to find a model which should ideally encourage the buyer to pay for value propositions of the technologies, services, resources. One option would be to have a few possible pre-selected business models tested by the ELG ecosystem. We plan to include the new revenue model in the final marketplace report (Deliverable D7.4).

Concerning the value-cost structures, the ELG will provide demand economies of scale to all participants: these are the cost advantages and positive compound effects, arising from demand aggregation, efficiencies in networks and technological improvements on the demand side. The marketplace will be powerful in exploiting network effects derived from the combined resources of its participants (industry, academia, community, pilots, etc.). In addition, the marketplace participants create value by tapping into resources and capacity that they don't have to own, making them asset light and reducing their current as well as fixed costs.

In addition to the before-mentioned business model, value creation and innovation aspects, the marketplace contains three more essential elements.

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[48] Prior to ELG such an umbrella platform did not exist and this lack had been identified as a gap by several studies.

2.3.3.4   Connection, Gravity and Flow

Where traditional offline marketplaces tend to push products and technologies to the market, new platforms like the ELG will create a pull-effect. Designed as a multi-sided platform it will be equipped to create so-called network effects, i.e., effects that attract new users to enter the marketplace to be part of an ever-growing number of partners who are also part of the network. Together they engage in a mutual value exchange process which is orchestrated by the ELG marketplace. The ELG infrastructure will enable easy access, meaning that participants can easily plug into the platform to share, transact and connect (connection).

The ELG will function like a magnet in creating a pull that attracts participants to the platform with its force. This will be achieved through various activities like community building, communication and exploitation in order to attract to and nurture the whole LT community on the ELG. Because it is both, a transaction and innovation platform, both LT-providers and LT-users (supply and demand) will be present to achieve critical mass.

The ELG will foster the flow of value by making connections between LT-providers and LT-users. Rich data will be used for successful matchmaking. The ELG will therefore promote the exchange and co-creation of value.

2.3.4   Implementation of the Strategy and Monitoring

After the development of the ELG marketplace strategy – including the definition of the main objectives and constituting elements – the strategy has to be implemented, monitored and refined. On a meta-level, the implementation will be guided by the ELG's vision and mission.

Vision: To become the "Primary Platform for Language Technologies in Europe"

Mission: In order to achieve this vision, the ELG will:

- Support the Multilingual Digital Single Market: ELG will strengthen the commercial European LT landscape by establishing a pan-European marketplace.
- Grow a vibrant community and help coordinate all European LT activities.
- Create a powerful and scalable LT platform: ELG's novel technological approach will enable innovations and synergies between commercial and non-commercial LT providers, buyers and users.

The main goals of the ELG marketplace need to be defined from a business perspective: generally speaking, most profit-oriented businesses strive for financial success as their ultimate outcome measures. For the ELG marketplace the main aim is to achieve sustainability and to cover the incurred costs on a long-term basis.

The implementation of the strategy will provide a framework for the translation of the objectives as defined in section 2.3.2 into action: sustainability, value creation, compound growth, visibility, community building.

For each of these factors a set of measures and targets will be defined in quantifiable and time-referenced manner and tracked over time. A management tool for describing, implementing and communicating the strategy will be selected in Deliverable D7.4 allowing to operationalize the model. Continuous application of this tool, measuring and evaluating the results will allow to determine the status of the individual factors and, in case of deviation, allow to take corrective measures. Several essential elements of the business model such as licensing, billing and revenue sharing as well as the legal entity for the ELG still have be defined. Likewise, to ensure sustainability, a legal entity for the ELG will be established in 2021.

2.4 Innovation Strategy

Innovation is a heavily overloaded and over-used term: everyone, be it individuals, research or commercial entities is innovative, works on innovative solutions, services and products or tries to come up with innovative ways to tackle challenging problems. Here, a more focussed notion of *innovation* is defined and examined and put into perspective regarding innovation in the ELG. This section provides a first overview of the elements of the innovation strategy to be developed, adopted and implemented by and for the ELG. Deliverables D8.4 and D8.5 will describe the innovation strategy in detail.

ELG's innovation strategy is linked with the *vision* and *business strategy* to establish and sustain (*sustainability*) the ELG as the primary marketplace for LT in Europe (for *the community*). Communication cuts across all of these areas and needs to be aligned with all of them. Viewed from the perspective of the ELG – the platform and its community at the centre – these strategies need to support each other and be aligned with each other as shown in Figure 12.

Figure 12: Strategies around the Platform and Community

As the business goals develop and mature, so will the innovation strategy, resulting in a continuous cycle of definition, evaluation and adaptation. Throughout the process, measures will need to be implemented to foster innovation, monitor progress and to provide the essential feedback. The evolution of these elements will be discussed in Deliverables D7.3 and D7.4 (from the perspective of the marketplace), Deliverables D7.8 and D7.9 (from the perspective of sustainability) and Deliverables D8.4 and D8.5 (from the perspective of innovation).

The close relation of all strategies and their importance for the ELG is evident. Only by aligning them and dealing with them in connection can the different kinds of challenges be adequately met.

When discussing the topic of innovation, both, the innovation during the lifetime *of the project* as well as innovation *beyond the project*, from the stand-point of an entity which may become the successor of the ELG project has to be considered (this approach is reflected in Section 2.3). Likewise, innovation can be viewed from the perspective of the participants/members of the ELG (ELG-Core) as well as from the perspective of the users of the ELG (ELG Community). Figure 13 shows these aspects.
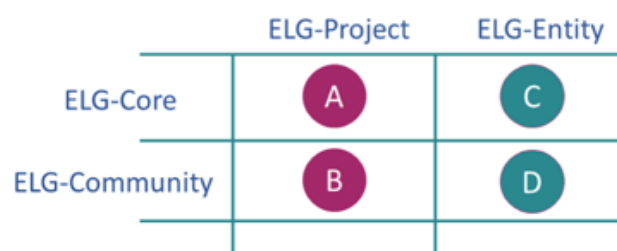
Figure 13: ELG Innovation Matrix

- *Group A* denotes all members of the ELG project, the consortium as well as the closely associated groups such as LT-Innovate, the NCCs or the Industry Advisory Board. Within Group A, the developers of the ELG itself are also included. Their needs – also as part of the wider ELG-community – are very specific and will be addressed only superficially within this deliverable. However, clearly the issue of innovation on the level of SW- and HW-development and SW-engineering is also an issue in the medium to long-term with regard to the ELG platform.
- *Group B* includes all users on the supply-side (*providers, suppliers*) as well as on the demand-side (*end-users, demanders*) who are formally not included in the ELG but who make use of the ELG to create value from its functionalities and the infrastructure and resources it offers, e.g., during the pilots staged by the ELG.
- *Group C* denotes the members of the entity for the ELG which will be created during a later stage (after the project's end), those *running the ELG*. From an organizational point of view, this may be a non-for-profit entity (details will be determined as part of the sustainability plan).
- *Group D* denotes the potentially much wider range of stakeholder going well beyond group B and representing the wider ELG-community (or even community of communities in case several platforms are connected) which will be the key for innovative success in the ELG.

There may be a certain degree of overlap between these groups, in particular between the Core and Community of the ELG with partners acting in both roles.

With regard to innovation, different aspects may be relevant to the above groups and hence they may also pursue different strategies. Existing innovation strategies of project partners need to be considered and may provide individual (and additional) paths for innovation (e.g., for the three SMEs but not only limited to those).

2.4.1 Definition of State-of-the-Art Innovation Concepts

The term **innovation** is used in a multitude of ways depending on the discipline and authors. Within this document it is used to denote "the implementation of a new or significantly improved product (service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations."[49] From this definition, it is clear that *innovation* is not the same as *invention* – a distinction which is important to keep in mind but which is often missed, leading to these terms being used almost interchangeably. While *invention* requires the creation of new ideas, processes or products, *innovation* moves one step further and requires implementation of the inventive act, the creation of an artefact. Innovation also implies a value system which seeks to derive a positive outcome from the inventive act. For example, actions

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[49] OECD and Statistical Office of the European Communities, 2005

which lead to a negative performance metric would not be considered innovative, even if they met the requirements of novelty and enabling actions. Likewise, inventions which do not find their way into practical use would not be considered an innovation. In general, innovation is characterized by delivering some positive outcome – whether it is tangible value, creation of a new market or a competitive advantage – and requiring actions to deliver this value which are new to the organization.

Innovation must create new value and/or capture value in a new ways[50] and must be adopted by customers, leading to Schrage's interpretation of innovation as: *innovation = invention + adoption*[51]. Innovation indeed requires *both aspects* to be regarded as such. This is reflected in the following definition of **innovation management** which comprises the "… overall management of all activities related to understanding needs, with the objective of successfully identifying new ideas, and managing them, in order to develop new products and services which satisfy these needs. Innovation management starts at the point of capturing the creative works and finishes when a product or service is deployed"[52].

The paradigms of innovation are manifold and general agreement exists that there is no simple "one-approach-fits-all" method for innovation. Traditionally, innovation focused on organizations or departments who managed innovation in a self-contained manner. The place of innovation as well as the process leading to it took place within the organization without interaction to the outside world – a model which is nowadays referred to as **closed or proprietary Innovation**. Depending on the exact circumstances, this model may still have its merits and is still employed by actors up to this date. However, in today's highly interconnected and virtualized world, innovation typically no longer takes place within such siloed environments, but rather follows an open approach – connecting many different disciplines, sectors and actors in a non-linear fashion. Innovation takes place within as well as outside of an organization with knowledge flowing in both directions (**coupled-open-innovation**). This open approach has been gaining traction as much for the industry as for academic research. It allows different actors to collaborate and experiment across organizational boundaries, across different sectors and disciplines and thus enables them to dynamically generate innovation in a heterogeneous eco-system. The concept of **open innovation** as coined by Henry Chesbrough reflects this setting and is adopted as the starting point for the discussion of *innovation* within the ELG: "Open innovation is the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively. [This paradigm] assumes that firms can and should use external ideas as well as internal ideas, and internal and external paths to market, as they look to advance their technology."[53]

Open Innovation is the targeted and systematic cutting-across boundaries between organizations, sectors and disciplines to generate new knowledge and to develop new products, services or processes. It combines the inclusion of non-traditional knowledge and backgrounds, inter-disciplinarity and new forms of online and offline collaboration. Justin Rattner, Intel's CTO has evangelized the concept of 21st century industrial research where innovation will be driven by teams of *boundary spanners* that possess multidisciplinary skills[54]. Online platforms provide ideal ecosystems offering the means to link up and collaborate and to assemble a multitude of participants with the aim to create novel products and services which are quickly adopted. They foster the

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[50] https://innovationmanagement.se/imtool-articles/how-do-you-define-innovation-and-make-it-practical-and-saleable-to-senior-management/
[51] Schrage, M. (2004), Interview in Ubiquity, ACM Publication, December 2004, ubiquity.acm.org
[52] Sweeney, E. (2014), Managing Impact and Innovation in H2020 Projects, Oxford, UK, September 2014
[53] Chesbrough, H., (2006), Open Innovation: Researching a New Paradigm
[54] Curley, M. and Salmelin, B. (2013), Open Innovation 2.0: A New Paradigm

sharing and exchange of knowledge and ideas between participants and allow ideas to flow from and to different organizations for exploitation. As a result of the increased diversity and connectedness of actors, the generation of genuinely new knowledge and more radical innovation is possible. Whether and to what extent these goals also materialize in practice depends on a variety of factors, such as acceptance and openness to a culture of open innovation that also supports the useful and selective sharing of research results and data. If exercised successfully, open innovation eliminates barriers in research, development and innovation and generates an innovation dynamic that cannot be achieved with traditional methods.

The concept of open innovation has also been adopted and extended by the EU under the **Open Innovation 2.0** paradigm[55], encompassing stakeholders in a quadruple-helix (industry, research, public sector and individuals/citizens) and emphasizing the end-user element even more. They are no longer regarded as the research object but rather become an integral part of the innovation process (Curley & Salmelin, 2013).

By the term **innovation strategy**, we refer to the "commitment to a set of coherent, mutually reinforcing policies or behaviours aimed at achieving a specific competitive goal, promoting alignment among diverse groups within an organization, clarifying objectives and priorities, helping focus efforts around them and specifying how various functions will support it."[56]

2.4.2   ELG Innovation Approach and Management

As outlined in Figure 12, different aspects of the ELG have to be considered when developing an innovation strategy. The focus of the ELG innovation strategy will be on innovation during the ELG project and innovation regarding the ELG-core members as well as a (limited) community and hence will focus on groups A and B with the matrix. It will take into account the strategies of the SME partners involved in the project.

Further groups, primarily concerning the long-term development after the project's end (groups C and D) are not considered in detail at this stage. However, they are deemed to become more important as the project progresses and will be addressed in later deliverables[57] and in connection with the sustainability strategy. At all stages, an open and collaborative approach to innovation will be adopted.[58]

The ELG is aware that the reality today is that innovation processes often lack openness as innovation directly correlates to financial success. Trust is the key hurdle to overcome when sharing and exchanging ideas. Forming a community with trust in the ELG and providing the adequate ecosystem thus pose key challenges for the ELG. Being able to accomplish an active community, linking up to create value chains presents a key benefit and major step forward from a fragmented and largely isolated LT landscape.

The over-arching goal of innovation activities within ELG has been specified as the following statement:

"To provide European LT research organizations with a reliable and scalable platform and, potentially, marketplace, through which they can offer, showcase, test and evaluate their technologies to interested stakeholders, typically also from research but also including industry."

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[55] https://ec.europa.eu/digital-single-market/en/policies/open-innovation
[56] Pisano, G. (2015), Harvard Business Review, June 2015
[57] Deliverables D8.4 and D8.5
[58] For the innovation within the core of the ELG platform, a rather closed approach is followed as the small groups of experts of the core team (and consortium) will manage and drive innovation. At due time, opening up with respect to this inner-circle will be considered.

This statement concerns a set of stakeholders covering all stages from invention to the final adoption of technologies and resources. A comprehensive innovation strategy requires to include all of the relevant actors as well as the interactions between them. Figure 14 provides a schematic overview of the actors and interactions which need to be aligned for value creation.
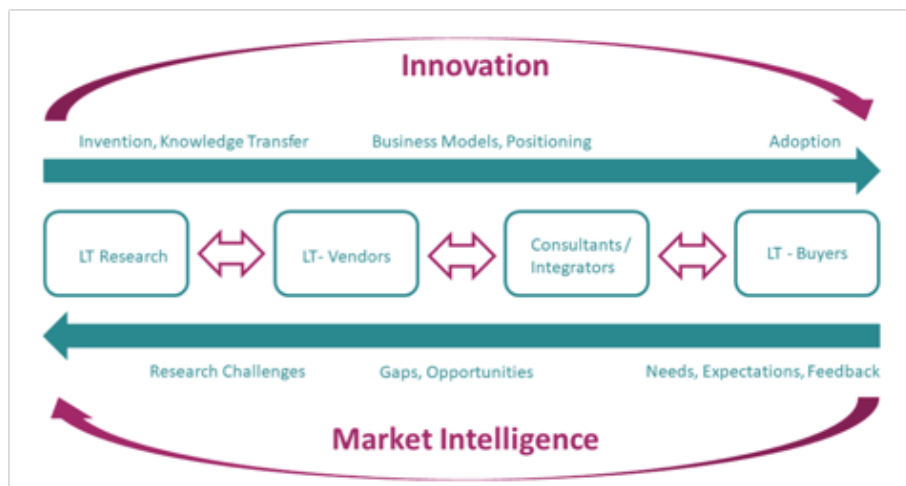

Figure 14: ELG Innovation Cycle

End-users and LT buyers with actual needs, identified by vendors, consultant and integrators feed these needs back to research and development who come up with novel solutions which are implemented in turn by suppliers of LT, integrated into existing environments (technical as well as organizational) and put into adopted in real-life. The chosen innovation strategy will be based on this scheme and provide guidance to the different aspects contained within the over-arching goal. Innovation is envisaged to focus on products and services and less so on processes. The innovation strategy will be developed accordingly and investigate various dimensions of innovation such as, the intensity, boundaries or objectives of innovation.

2.4.2.1 Open Pilots

The first call for open pilots launched in March 2020 provides a first opportunity for ELG to gather feedback and insights from external users, i.e., parties who are not involved in the project itself. They will serve to gain experience and gather feedback on a multitude of levels, from purely technical aspects, to procedural and commercial issues as well as regarding innovation activities. The two kinds of projects which will be funded aim at the following two areas: (1) contribution of resources, tools and services to the ELG platform or marketplace; (2) applications using language resources and technologies from the ELG.

Whereas the first area aims at the extension of the capabilities provided by and within the ELG, the second aims at the creation of innovative solutions based on the ELG. Type (1) projects support innovation in the sense that an amplified and broad basis of technologies and resources effectively extends the building blocks from which new value can be created. The type of innovation can be expected to be more of a push/supply-side kind with gradual extension of the portfolio of technologies and resources and driven by individual teams (rather than in extensive, open collaboration). Type (2) projects may yield new value by the creation of more complex services, requiring an orchestrated implementation of individual components and services and thus focus more on the creation of value by introduction of new, extended or enhanced services. The result of these kinds of

projects could be an improved, extended performance and efficiency created by the interplay of a set of partners, together creating innovative solutions. The latter style could be driven from both, the supply- as well as the demand-side with expectations on the demand-side, including actual customers for whom value will be created. Consequently, Type (2) projects will be especially welcome.

For both types, the pilots aim to provide the flexible environment needed to experiment in an agile manner and to provide the framework for projects with long-term potential, which is to say value creation in a sustainable way. Innovative aspects will be monitored during as well as after the pilots and insights be used as feedback for adjustment of the ELG innovation strategy.

2.4.2.2   Existing Innovation Strategies of Project Partners

Several partners of the ELG consortium have developed their own, internal innovation strategies which, depending on the nature and size of the partner, differ substantially. Whereas these respective strategies have been implemented prior and in parallel to the ELG project, certain elements will be aligned yielding elements which support the overall ELG innovation strategy. The innovation strategy to be developed within Deliverable D8.4 will outline how these individual strategies fit within the ELG strategy and how they support it.

2.4.2.3   Implementation of the Innovation Strategy

Based on the elements described above, an innovation strategy will be devised and presented in Deliverable D8.4 (M24). It will further be devised in Deliverable D8.5 (M36) which form the strategy to be followed beyond the end of the ELG project. Due to the intimate connection with sustainability, it will also feature in D7.8 and D7.9. In a highly dynamic domain such as LT, change is the only constant which should be counted on. Any static, long-term innovation strategy would be bound to fail from the start. However, employing a dynamic and flexible framework with yearly revision provides a viable way forward. The ingredients to allow for such a flexible framework will be developed jointly by the consortium members and laid out in Deliverable D8.4.

2.4.2.4   Role of the Innovation Manager within ELG

The Innovation Manager (IM) will act as the glue and catalyser between the different parties and try to moderate the discussions and decisions. In particular the IM will form the bridge between the innovation strategy and the work carried out within the individual WPs. The IM will liaise with industry organizations, foremost with LT-Innovate and ensure their participation in the revision of the innovation strategy as well as ensuring that their concerns and input are indeed reflected in the innovation strategy. The IM will likewise be the contact point for the commercial partners' input regarding all concerns regarding innovation (input also in the sense of requirements to the ELG). Finally, the IM will aim to provide guidance for the prioritization of services and resources developed within the ELG to match the goals of the innovation strategy.

2.5   Towards the Primary Platform for LT in Europe – The Platform of Platforms

The following section describes steps and activities planned in making the ELG a successful marketplace.

2.5.1   Developments and Activities within ELG

The ELG platform, once fully operational[59], will ideally attract a large number of stakeholders from various disciplines, and will act as a bridge between researchers, producers, sellers and buyers of language data, services

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[59] It should be emphasized that even in March 2020, the ELG platform is already operational and ready to support a set of pilot projects.

and technologies. Since day 1, the project has been organizing events to spread the word, informing all stake-holders about the platform, highlighting the outcomes, and motivating them to join the community.

To facilitate the interaction of stakeholders and communities with the project, ELG has set up 32 National Competence Centres (NCCs) throughout Europe. The NCCs strengthen the outreach and visibility not only by disseminating project results or promoting events through their established channels, but also by sharing their national/regional know-how (resources, tools and services, companies, research communities and activities, etc.). The NCCs take part in activities like helping to organize local workshops or hackathons and giving feedback to the ELG from a national viewpoint after such events.

Another such body is the Language Technology Council (LTC). Its goal is to establish easy and efficient communication and coordination at the European level, regarding national and international research, development and innovation activities in LT. Preparing strategic recommendations, especially geared towards national and European administrations and funding agencies, is also among the tasks of the LTC. The NCCs serve as members of the LTC, but can also nominate potential council members from their regions and countries. The establishment, duties, and responsibilities of the NCCs and the LTC are explained in detail in Deliverable D7.2: National Competence Centres and Language Technology Council.

Apart from community building activities, ELG is also actively hosting events to bring the academia and the industry together. The biggest and most important of such events is the META-FORUM conference series. META-FORUM is the annual international conference on LT in Europe, which was initiated in 2010 by the META-NET Network of Excellence. For the term 2019-2021 several events have been and will be organised: the annual ELG conference where the current state of the ELG initiative is demonstrated as well as META-FORUM. The ambition for the upcoming years is to attract a large and varied number of participants so that all relevant stakeholder groups are adequately and representatively covered. In this direction, the eighth edition of the META-FORUM was organised as a two-day event in Brussels, Belgium, on 8-9 October 2019, with the goal of disseminating the project outcomes so far and promoting the ELG as the primary platform for LT in Europe. It attracted 175 visitors from 31 countries across Europe, with a distribution of 16% from various administrations, 26% from industry and 58% from research, including researchers from commercial companies. The fact that it was hosted in Belgium allowed ELG to reach to many representatives of the EC, the EP, and other European bodies, which was important for Europe-wide recognition of the project from an administrative standpoint. META-FORUM 2019 also featured a project expo to enable profound exchange of information on various approaches in the relevant active research projects. The names of the projects represented in the project expo (16) were AI4EU, Bergamot, COMPRISE, Elexis, ELG, ELITR, ELRC, CEF AT, EMBEDDIA, Fandango, Gourmet, Lynx, MARCELL, Memad, Prêt-à-LLOD, QURATOR, SPEAKER, WeVerify. The ELG platform received great interest during and after META-FORUM 2019. Some companies expressed their interest in including their services into the platform, many expressed their intention to respond to the Open Calls for pilot projects. More details about META-FORUM 2019 can be found in Deliverable D7.5: ELG Conference 2019 and LTC Meeting 2019. ELG will continue to organise the event with the ambition to attract a larger community (potential users and new providers of content) with adequate representation of all relevant stakeholder groups.

Another recent European event in which the ELG was presented was the consultation and brainstorming session regarding LT in Digital Europe Programme (DEP), organized by the EC in Brussels on 10-11 February 2020. 40 attendees, mostly from industry but also some from research, discussed the role and priorities regarding LT

from their perspectives. The overall reception and perception of ELG from almost all participants was highly positive, and many of the demands and wishes contained tasks which could be addressed by ELG. Most of the SME representatives which attended the event expressed their interest in participating in the ELG and the Open Calls. In short, ELG was very well positioned with regard to DEP, and the feedback showed a potential high reception for the ELG initiative, once completed.

2.5.2 Key Instruments for Success

ELG finds establishing a continuous and structured dialogue with all relevant national and international stake-holders as one of the most important instruments for success. ELG will continue reaching out to representatives of research centres, industry, national funding agencies, national language institutes, national and international stakeholder initiatives, associations, through members of the consortium, the ELG NCCs, and the LTC.

One of the most important cornerstones with regard to increasing the gravitational force of the ELG is community building: community building is relationship building but taken one step further. It entails two-way communication, mutually beneficial relationships, creation of trust and the ability to connect people. The key instruments for success rely on the ELG's ability to create, nurture and grow an ecosystem of participants.

2.5.3 Challenges

Every endeavour has its challenges. Even with the best strategies at hand, implementation and execution of a strategy might be a challenge which is sometimes due to a gap between perceived reality and actual reality. Before a marketplace strategy can be implemented, regular reality checks and feedback loops from the LT-market should be considered. At the end of the day, the bait must attract the fish, not the fisherman. This leads to next challenge of how to find and define a proper go-to-market strategy for such an umbrella platform, comprising hybrid customer needs, languages and verticals. To meet this challenge, the ELG is working towards formulating a common vision and cultivating trust.

Finally, in order to ensure sustainability, the ELG will need funds to cover all incurred costs (fixed or current) incurring. The plan is to sell services, resources and components via the marketplace. The next marketplace report will analyse different types of revenue models more thoroughly.

3 Summary and Outlook

This deliverable provides a comprehensive overview of the marketplace strategy to be developed and implemented for the ELG. It is the first in a series of logically related deliverables dealing with central and inter-connected topics such as business strategy, community and communication, sustainability and innovation aspects of the ELG. All of these strategies need to be developed, implemented, monitored, refined and aligned in a coherent way during the lifetime of the project. Beyond the project, activities regarding sustainability will ensure the continuing presence of ELG. For several of the deliverables different versions will be published corresponding to the progress made and lessons learned within the project. Each one will integrate findings and allow the consortium to adjust the direction of efforts.

The current deliverable provides a general overview of the state-of-affairs of the European LT market and outlines the path to making the ELG the primary marketplace the consortium envisions it to turn into. It considers the LT market from a supply and demand side and from an academic to an industry perspective. From a set of

criteria and possible realizations, a particular type of platform – the integrated platform – is identified as the most adequate and promising alternative for the ELG. However, in the dynamic arena of LT the only thing which can be counted on is change itself. Thus, a clear and transparent strategy (including an update process) based on evidence and market intelligence, carried out diligently in cycles is required to keep the ELG on course. In the period leading up to this deliverable, several verticals which merit activity have been identified (healthcare, life-sciences, defence, government). But only through continuous monitoring and updating of strategies will it be possible to achieve the goal of establishing the ELG as the one marketplace for LT in Europe.

The ELG itself is envisioned to provide industry-grade components and resources, professional services and integrators, a marketplace for services to meet and a solid and trustworthy backbone on which all of this is carried out. The creation and maintenance of a vibrant community of research, industry, integrators and consultants form further building blocks. These serve to provide not only technical but also managerial and organizational guidance and support for the integration and deployment of LT. Trust in the ELG and into its community will be the key to attract new members for the community. Alliances with similar activities and activities in the AI domain – positioning LT as the core of many subfields of AI – are aimed at allowing the ELG to participate in the rapid growth and interest in AI. Easy and seamless integration of services and resources and a clear and transparent model for user feedback will further boost trust and confidence in the platform.

Following the creation of this deliverable, subsequent deliverables will build upon the foundations laid within this deliverable and extend and refine its findings.

The next steps following the completion of this deliverable will comprise:

- Creation of a clear and transparent model of platform governance, licensing and billing – establishing the ELG as the single point of contact for customers and integrators
- Orientation on further verticals
- Increase the visibility and reach of the ELG through the open pilots and workshops at conferences
- Emphasise the positioning of ELG as a 'platform of platforms' in order to create alliances and not cause confusion or cause competition
- Boosting and fostering alliances with AI projects and activities to further enhance the reach and visibility and to tap into the growing market and opportunities
- Continuous market scanning and feedback
- Feedback and insights from all activities will be used to re-calibrate the KPIs of ELG