



<i>Project Acronym</i>	<i>SoBigData</i>
<i>Project Title</i>	<i>SoBigData Research Infrastructure Social Mining & Big Data Ecosystem</i>
<i>Project Number</i>	<i>654024</i>
<i>Deliverable Title</i>	<i>Final Innovation Report and Action Plan</i>
<i>Deliverable No.</i>	<i>D5.2</i>
<i>Delivery Date</i>	<i>17 December 2019</i>
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DOCUMENT INFORMATION

PROJECT	
Project Acronym	SoBigData
Project Title	SoBigData Research Infrastructure Social Mining & Big Data Ecosystem
Project Start	1st September 2015
Project Duration	52 months
Funding	H2020-INFRAIA-2014-2015
Grant Agreement No.	654024
DOCUMENT	
Deliverable No.	D5.2
Deliverable Title	Final Innovation Report and Action Plan
Contractual Delivery Date	30 November 2019
Actual Delivery Date	17 December 2019
Author(s)	Kalina Bontcheva (USFD)
Editor(s)	Kalina Bontcheva (USFD), Beatrice Rapisarda (CNR)
Reviewer(s)	Nino Antulov-Fantulin (ETHZ), Alice Tucker (USFD), Beatrice Rapisarda (CNR)
Contributor(s)	All
Work Package No.	WP5
Work Package Title	Accelerating Innovation
Work Package Leader	ETHZ
Work Package Participants	USFD, CNR, Fraunhofer, UT, KCL, SNS, AALTO UNIVERSITY, ETH Zurich
Distribution	Public
Nature	Report
Version / Revision	V1.0
Draft / Final	Final
Total No. Pages (including cover)	45
Keywords	Impact, innovation, knowledge transfer, IPR, open source software

DISCLAIMER

SoBigData (654024) is a Research and Innovation Action (RIA) funded by the European Commission under the Horizon 2020 research and innovation programme.

SoBigData proposes to create the Social Mining & Big Data Ecosystem: a research infrastructure (RI) providing an integrated ecosystem for ethic-sensitive scientific discoveries and advanced applications of social data mining on the various dimensions of social life, as recorded by “big data”. Building on several established national infrastructures, SoBigData will open up new research avenues in multiple research fields, including mathematics, ICT, and human, social and economic sciences, by enabling easy comparison, re-use and integration of state-of-the-art big social data, methods, and services, into new research.

This document contains information on SoBigData core activities, findings and outcomes and it may also contain contributions from distinguished experts who contribute as SoBigData Board members. Any reference to content in this document should clearly indicate the authors, source, organisation and publication date.

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DELIVERABLE SUMMARY

This deliverable brings together the work of T5.1 and T5.2. It updates D5.1 Innovation and Action Plan, reflecting the progress of the SoBigData infrastructure over the course of the entire project. It also outlines future actions needed in order to fully realise the project's innovation potential.

EXECUTIVE SUMMARY

This deliverable reports work carried out for T5.1 Partnerships with industry and contributions to policymaking and T5.2 Knowledge Transfer and Consulting Services.

The report updates D5.1 Innovation and Action Plan, reflecting the progress of the SoBigData infrastructure over the course of the entire project. It also outlines future actions needed in order to fully realise the project's innovation potential.

As a result of work carried out in Task 5.2, this deliverable also contains the newly developed template non-disclosure agreements and consulting services contracts, in order to lower the barrier for SMEs and non-profits to benefit fully from the new European infrastructure.

1 RELEVANCE TO SOBIGDATA

One of the aims of the SoBigData project is to engage with and widen the starting community of scientific, industrial, and other stakeholders (e.g. policy makers), supported by transnational and virtual access activities on one hand, and extensive stakeholder engagement and innovation actions on the other. It is the latter activities that are the focus of this deliverable.

1.1 PURPOSE OF THIS DOCUMENT

The purpose of this document is to provide the consortium with a concrete plan of actions towards improving the innovation capacity and strengthening growth of European big data companies, through knowledge transfer, consultancy services, and engagement in the SoBigData community and e-infrastructure. The objectives can be summarised as follows:

- To undertake a wide range of innovation activities aimed at industrial and other stakeholders (e.g. government bodies, non-profit organisations, funders, policy makers)
- To undertake social innovation activities through building partnerships with industry and other key stakeholders through knowledge transfer and consulting services
- To main and promote high quality open SoBigData tools and services, with clear licensing terms
- To offer consultancy services
- To train data scientists in entrepreneurial skills
- To make contributions to policy making
- To involve relevant industrial and standardisation bodies as SoBigData stakeholders.

1.2 RELEVANCE TO PROJECT OBJECTIVES

Innovation acceleration is a key activity within the project objectives. The focus of SoBigData is on development of a research infrastructure (RI) providing an integrated ecosystem for ethic-sensitive scientific discoveries and advanced applications of social data mining on the various dimensions of social life, as recorded by “big data”. The SoBigData infrastructure and tools open significant innovation opportunities aimed at diverse stakeholders. Therefore, a careful planning of the innovation actions to be taken is of the highest importance.

1.3 SOBIGDATA PROJECT DESCRIPTION

SoBigData will serve the wide cross-disciplinary community of data scientists, i.e., researchers studying all aspects of societal complexity from a data- and model-driven perspective, including data and text miners, visual analytics researchers, socio-economic scientists, network scientists, political scientists, humanities researchers, and more.

The SoBigData RI will be based on three pillars:

1. An ever-growing, distributed data ecosystem for procurement, access and curation of big social data, to underpin social data mining research within an ethic-sensitive context.
2. An ever-growing, distributed platform of interoperable, social data mining methods and associated skills: tools, methodologies and services for mining, analysing, and visualising complex and massive

datasets, harnessing the techno-legal barriers to the ethically safe deployment of big data for social mining.

3. A starting community of scientific, industrial, and other stakeholders (e.g. policy makers), supported by transnational and virtual access activities, and brought together by extensive dissemination, networking and innovation actions (in particular workshops, summer schools, datathons, training resources in social data mining, knowledge transfer, industrial partnerships).

1.4 RELATION TO OTHER WORKPACKAGES

Dissemination and impact generation activities are horizontal activities that last for the entire duration of the project. Therefore, there is a clear interaction with all work packages.

It is worth mentioning that the relation of dissemination and impact generation with other work packages is planned as a two-way interaction. On the one hand, all work packages provide feedback, both for dissemination (partners from the networking and joint research activities work packages will provide ideas, presentations, papers, news, etc.) and impact on stakeholders (potential results of each JRA work package, licensing approaches, etc.).

On the other hand, WP3 aims to provide feedback to the rest of the work packages in order to influence their work at multiple levels: watching what is going on in the scientific and commercial spheres, to drive work in the right and timely direction, suggesting changes on the licensing of different components to ensure the complementarity of the results, offering ideas on how small enhancements could be better perceived by the stakeholders, etc. In the second half of the project, sustainability will be a particular focus.

2 INNOVATION STRATEGY

The innovation activities are widening the project impact beyond the target scientific communities, to include **outreach towards businesses in diverse sectors (especially SMEs)**, as well as **other stakeholders** (e.g. government bodies, funders, policy makers).

Key to innovation success is stakeholder engagement, where SoBigData is targeting:

1. Big data analysts in commercial research labs, enterprises, and SMEs, who want to enhance their algorithms to deal with social data;
2. Economists, journalists, policy and lawmakers, who have to analyse the avalanche of (big) social data, in order to gain insight and actionable knowledge.
3. The public as a whole, who would like to understand their role in the production, consumption and value creating of social data.

SoBigData has a multi-channel innovation strategy, including, but not limited to:

1. Providing paid-for services, consultancies, and knowledge transfer activities to businesses and other key stakeholders
2. Release of open-source software and services to enable affordable large-scale social data analysis
3. Training data scientists in entrepreneurial skills
4. Contributions to policy making
5. Participation in relevant industrial and standardisation bodies.

To further examine this, Section 2 is broken down into the following sections: positioning analysis, innovation activities already undertaken, and innovation success indicators.

2.1 SOBIGDATA POSITIONING: ANALYSIS

<p>What makes the SoBigData infrastructure attractive to commercial users?</p>	<p>SoBigData provides a common infrastructure, comprising of numerous, state-of-the-art tools for social mining. This is coupled with world-leading research expertise, which businesses can deploy, in order to improve their product(s) and software or to investigate new uses/business ideas for their data.</p>
<p>What makes the SoBigData infrastructure attractive to policy makers?</p>	<p>Based around a number of exploratory projects, SoBigData binds advanced research tools with real case studies of how useful knowledge on user behaviour and opinions can be gleaned from social data. City of Citizens, Polarised Debates, and Social Well Being are examples of how SoBigData tools can be useful for policy makers. There are also a number of ongoing</p>

	collaborations with policy makers, which will act as early adopters.
What makes the SoBigData infrastructure attractive to NGOs and other non-profit users?	SoBigData promotes open science and most of its tools are provided for free.
Contributions to policy making	KDD Lab has ongoing projects with local Italian public administrations and with national public organizations. Secondly, the results from UT’s research into Evidence Informed Policy Making with Statistics of Estonia will provide policymaking input at the state level. Thirdly, USFD worked with Nesta on analysing debates in social media on key policy issues. USFD also provided evidence to the UK DCMS Parliamentary inquiry into “fake news” and disinformation and the inquiry into democracy, free speech and freedom of association carried out by the UK Parliamentary Joint Committee on Human Rights.
Contributions to e-government	UT studied execution logs of the Estonian state information system for finding integration patterns for optimization of state information systems and identification of governmental KPI-s which could be nowcasted in near real-time by monitoring execution logs of governmental services.
What is the SoBigData unique selling point?	A state-of-the-art, open software infrastructure and expertise open to companies, researchers, and other stakeholders, to dig into big social data, irrespective of their proficiency level as data analysts. Our key asset is to have in one single place a wide offering of expertise and tools, to manage current challenges that typically need interdisciplinary competences.
How will the target stakeholders benefit from the SoBigData research infrastructure?	A unique multi-disciplinary infrastructure and expertise, which is sufficiently diverse that they can find the tools and knowledge that they need, in order to analyse big social data effectively, through a single point of entry (virtual or physical).

2.2 OPEN SOURCE SOFTWARE: A KEY INNOVATION DRIVER

One of the key innovation drivers behind SoBigData is open source software, which is made easily discoverable, usable, and interoperable through the SoBigData infrastructure.

The consortium partners already offer a number of open source software tools. They form the core seed for commercial exploitation, knowledge transfer, and consultancy services offered as part of the SoBigData

infrastructure, as well as (in some cases) as stand-alone software downloads and services. This list has grown significantly during the 4 years of the project.

Name of OS Tool/Free Service	URL where available	Brief Description	Ownership	Vertical(s) addressed	License	When available	Innovation Services Offered
GATE text analytics platform version 8.6	http://gate.ac.uk/	The core GATE text analytics platform, including representations for documents, corpora, annotations, and ontologies. Text processing algorithms are grouped into plugins, which are either bundled with core, or available through download sites.	USFD (core) + various others for each plugin	Various, including social media analysis, healthcare, business intelligence, data science, computational social science, digital humanities, etc	LGPL (but each plugin has its own license)	V 8.6 released 10 June 2019	Training, consultancy, customisation services
TwitIE	https://gate.ac.uk/wiki/twitie.html	An open-source text analysis pipeline for English tweets and other short social media messages.	USFD (but depends on a Stanford POS tagger)	Same as GATE above	LGPL	Already available, as part of GATE	Training, consultancy, customisation services, web service deployment
User Mention Categoriser	https://cloud.gate.ac.uk/shopfront/displayItem/showItem/so-bigdata-user-classification	Categorises @mentions in tweets as persons, locations, organisations, products, or other. Where possible, also assigns a finer-grained sub-category, such as a person's profession or the type of organisation.	USFD	Same as GATE above	LGPL	Available on GATE Cloud	Training, consultancy, customisation services, web service deployment
YODIE	https://gate.ac.uk/application/yodie.html ; https://cloud.gate.ac.uk/shopfront/displayItem/yodie-en ; https://cloud.gate.ac.uk/shopfront/displayItem/yodie-en	This is a multilingual entity linking and disambiguation framework, which is still undergoing development. The core version uses DBpedia but is easily adaptable to other LOD resources. There	USFD	Same as GATE above	LGPL	Available on GATE Cloud	Training, consultancy, customisation services, web service deployment

	ud.gate.ac.uk/shopfront/display/item/yodie-de ; https://cloud.gate.ac.uk/shopfront/display/item/yodie-fr ; https://cloud.gate.ac.uk/shopfront/display/item/yodie-es	are already some domain-specific adaptations, e.g. bioYODIE.					
Language Identification for Social Media Posts	https://cloud.gate.ac.uk/shopfront/display/item/tweet-langID-pipeline	A text analysis service for automatic language identification of individual social media posts. It can identify English, French, German, Dutch and Spanish short posts.	USFD	Same as GATE above	LGPL	Already Available	Training, consultancy, customisation services, web service deployment
Rumour veracity classifier	https://cloud.gate.ac.uk/shopfront/display/item/rumour-veracity	User generated content such as tweets often make claims that are unsubstantiated and possibly untrue. This service attempts to classify whether a text is discussing a rumour that is true, false or unverified.	USFD	Same as GATE above	SaaS – free to use	Already Available	Training, consultancy, customisation services, web service deployment

The Brexit Analyser Pipeline	https://cloud.gate.ac.uk/shopping/display/item/solution/bigdata-brexit	<p>A pipeline designed to detect political topics, hashtags, URLs, user mention, and hashtag-based voting intentions, expressed in tweets about the UK's referendum on membership of the EU (the "Brexit Analyzer"). It works best on tweets in the original Twitter JSON input format. Upload your own or harvest some with our Twitter Collector.</p>	USFD	Same as above	SaaS – free to use	Already available on GATE Cloud	Same as above
The UK Political Analyser	https://cloud.gate.ac.uk/shopping/display/item/solution/bigdata-politics	<p>A pipeline designed to detect political topics, UK politician names (as valid at the 2017 General Election), abusive terms and sentiment, in addition to Twitter-specific data such as location (NUTS) where possible, hashtag, user names etc. It works best on tweets in the original Twitter JSON input format. Upload your own or harvest some with our Twitter Collector.</p>	USFD	Same as above	SaaS – free to use	Already available	Same as above

TagME	http://acube.di.unipi.it/tagme	Entity linking on text	UNIPI	Various, including social media analysis, news, healthcare, business intelligence, data science, computational social science, digital humanities, etc	SaaS; Version 1.0 is free and available via API and open-source (Apache 2.0); version 2.0 will be free up to a cap for research; pay-per-use over some cap and for commercial uses	Available	Training, consultancy, customisation services, web service deployment
Twitter Monitor	https://services.d4science.org/group/sobigdata.eu/twitter-monitor		CNR		SaaS; free up to a cap or for research purposes	Available	Training, consultancy, customisation services, web service deployment
M-Atlas	http://m-atlas.eu/	Atlas of Urban Mobility. Analytical tool for Mobility data	CNR		LGPL	Already available	Training, consultancy, customisation services
UMA	http://kdd.isti.cnr.it/uma/	Example of Urban Mobility Application	CNR		WebPage	Already available	Consultancy
Demon	http://kdd.isti.cnr.it/~giulio/demon/	Community discovery in complex networks	CNR		LGPL	Already available	Training, consultancy, customisation services
GeoTopics	http://mmathioudakis.github.io/geotopics/	a system to explore geographical patterns of urban activity, extracted on foursquare data	AALTO	Urban computing	MIT	Available	Training, Consultancy
Smaph	http://smaph.mkapp.it/	Entity linking on queries	UNIPI	Opinion mining, Information Retrieval	Apache 2.0	Already available	Training, consultancy, customisation

							on services, web service deployment
QuickRank	http://quickrank.isti.cnr.it/	Suite of Learning to Rank algorithms	CNR-HPC	All range of ranking, prediction and recommendation applications	Reciprocal Public License 1.5 license	Already available	Training, consultancy, customisation services
Living Science	http://livingscience.isti.cnr.it/	Online system that tracks scientific publications	ETHZ	Online textual data	Webpage	Already available	Training, research, customisation services
Interactive Learning Materials	https://ckan.sobigdata.d4science.org/dataset/interactive-learning-environments	Data science interactive training materials based on R and Python	KCL	Information Retrieval; Other Network data; Spatio-temporal data; Text mining; Web data	Open	Already Available	Interactive content, that combine instruction, data and code and even multimedia elements
Jupyter Notebooks	https://ckan.sobigdata.d4science.org/dataset/jupyter_notebooks	Complete stories around Jupyter Notebooks that form easy recipes for reproducible methods in social data science	KCL	Information Retrieval; Network analysis; Online Social Network data; Simulation; Spatio-temporal data; Text mining; Web data	Open	Already Available	Apache Spark teaching and experimentation environment that allows users to participate in ad-hoc clusters via Jupyter and produced corresponding multimedia guides.
Smaph	https://sobigdata.d4science.org/web/smaph	Smaph does entity linking on web queries and very short text, meaning it disambiguates query terms linking them to their unambiguous meaning represented as an entity in a Knowledge base.	UNIPI	Web Search			

Wiser	https://wis er.d4science.org/search	Expert profiling among the researchers of the university of Pisa	UNIPI	Expert profiling in the academic context, and not only			
WAT	https://sobigdata.d4science.org/web/tagme/wat-api	Same as TagMe but better performing on well-formed texts	UNIPI	Information Retrieval, Web Search, Information Extraction			
SWAT	https://sobigdata.d4science.org/web/tagme/swat-api	entity-salience system, which identifies on-the-fly the semantic focus of a document, expressed by its Salient Wikipedia Entities.	UNIPI	Information Retrieval, Web Search, Information Extraction			
Egonetwork analyser	http://data.d4science.org/ctlg/ResourceCatalogue/egonetworks	This Python package contains classes and functions for the structural analysis of ego networks.	CNR-IIT	Online Social Networks analysis, Graphs, Socio-cognitive models	Open	Already available	
DIAS	http://dias-net.org/dias-gdelt-live/	DIAS, the Dynamic Intelligent Aggregation Service, is a fully decentralized multi-agent networked system for lightweight data analytics, such the computation of aggregation functions. Spin-off from Nervousnet system.	ETHZ	Information retrieval		Already available	

Further methods and services to be developed as part of the follow up SoBigData++ project will be considered for making available as open source. Since the project is seeking to maximise take up by SMEs and other stakeholders outside of academia, commercially friendly licenses have been chosen where possible or, where this is not suitable, a dual licensing option is offered.

Open source alone is not enough - the infrastructure and new services are being supported, maintained and promoted, and the communities of developers nurtured and organised. Many SoBigData partners have a proven track record in this area, which has been a solid basis for starting and growing the SoBigData user community. To maximise take up of the SoBigData RI, it was promoted firstly to the existing user

communities of the underpinning national infrastructures. More importantly, the RI was also provided as easy-to-use web services for virtual access by any European researcher, anywhere. Accompanying documentation, training materials, and example code have also been made available, as well as training events and datathons were organised. With respect to the datasets shared through the SoBigData RI, we aimed to maximise their take up through adoption of relevant Open Data standards and promotion and publication in other relevant data repositories.

To complement the open source offerings, SoBigData partners also offer some paid-for tools, through the software-as-a-service model. Some of the services offer a freemium model, i.e. free use for researchers and/or commercial users within a given quota; paid-for use otherwise. Currently, there are just several services available or planned (see below), which is due to the computational infrastructure, quality of service, and support overheads that these require. Over the next few years as the SoBigData infrastructure and its virtual access facilities grow even further, we expect that this set will expand accordingly. It must be noted that there are significantly more datasets and tools available under virtual access to researchers. Here our focus is purely on the paid-for services, which constitute a core part of the SoBigData innovation offerings.

Name of Paid-for Tool Service	URL where available	Brief Description	Ownership	Vertical(s) addressed	Cost	When available	Target users
GATE Cloud	http://cloud.gate.ac.uk	A platform-as-a-service for text analytics. Hosts web services in numerous languages and domains.	USFD	Same as GATE above	Freemium model, providing a mix of quota-based free and paid-for services	Already available	SMEs experimenting with text analytics; companies; data scientists; users of text analytics in specialised domains, like digital humanities, journalism, business intelligence
TagME	http://acube.di.unipi.it/tagme	Entity-linker for textual data	UNIPI	Same as TagMe above	Pay-per-use commercial use; each service priced differently	Already available	SMEs experimenting with text analytics; company R&D departments; Universities
Smaph	http://smaph.mkapp.it/	Entity linking on queries	UNIPI	Opinion mining, Information Retrieval	Pay-per-use commercial use;	Already available	Anyone interested in query analytics

					each service priced differently		
Wiser	https://wiser.d4science.org/search	Profiling of researchers	UNIPI	User profiling, Information Retrieval	Free for research; pay-per-use in case of personalization for commercial uses	Already available	Anyone interested in searching expertise in the University of Pisa
WAT	https://sobigdata.d4science.org/web/tagme/wat-api	Entity-linker for textual data	UNIPI	Same as TagMe above	Free for research; pay-per-use in case of personalization for commercial uses	Already available	SMEs experimenting with text analytics; company R&D departments; Universities
SWAT	https://sobigdata.d4science.org/web/tagme/swat-api	Entity-linker for textual data with entity-salience information	UNIPI	Same as TagMe above	Free for research; pay-per-use in case of personalization for commercial uses	Already available	SMEs experimenting with text analytics; company R&D departments; Universities

2.3 INNOVATION ACTIVITIES ALREADY UNDERTAKEN

Partner	Innovation Activity	Short Description	Relationship to WP5
USFD	Member of the Ontology-Lexica Community Group of the World Wide Web Consortium (W3C)	Standardisation activity http://www.w3.org/community/ontolex/	Input to relevant standardisation activities
USFD	TimeML contributors	Standards for representation of temporal expressions in text	Input to relevant standardisation activities, esp. since social media data is strongly temporal
USFD	Clarín UK (member)	Clarín UK focuses on the national context of the pan-European Clarín initiative, considering data distribution, re-use, training user support, resource and service integration, access and authorization. Clarín is a European collaborative effort to create, coordinate and make language resources and technology available and readily useable, focussed primarily at the digital humanities and social sciences.	Collaboration with a relevant pan-European humanities ESFRI infrastructure
USFD	Collaborations with end users of big data analytics tools	Currently these include Nesta, the BBC, Press Association, Financial Times, Thompson Reuters, Elsevier, the British Library, the UK National Archives, First Draft, ITV, BuzzFeed, Ofcom.	Collaboration with industry (Task 5.1)
USFD	Collaborations with providers of big data analytics tools	Continued close collaborations with Ontotext, Synaptica, Text Mining Solutions, WebLyzard.	Collaboration with industry (Task 5.1)
USFD	Collaborations with policy makers	USFD provided evidence to the UK DCMS Parliamentary inquiry into “fake news” and disinformation and the inquiry into democracy, free speech and freedom of association carried out	Collaboration with policy makers (Task 5.1)

		by the UK Parliamentary Joint Committee on Human Rights	
UT	Collaboration with Microsoft/Skype on Large-scale Social Network Analysis	Analyzing the structural properties of the global Skype social graph (800+ million nodes, 6+ billion edges) and linking these properties to phenomena of interest to Microsoft/Skype (e.g. user engagement, product adoption and spread, fraud). Resulted in 3 US patent applications, 8 prototypes, and 6 research papers.	Collaboration with industry (Task 5.1)
UT	Collaboration with Statistics Estonia on evidence informed policy making	Project partners can work in the offices of Statistics Estonia to analyse data in aid of policymaking. The data sets available include census data, data on companies and salary data for the last decade. For the salary data, all the people employed in Estonia during that time span are included. The relationships between salary inequalities and company growth, as well as different personal development patterns (analysed with clustering) present in the salary data are studied.	Collaboration for policy making (Task 5.1)
FRAUNHOFER	Member of the Federal Association for Information Technology, Telecommunications and New Media, Bitkom e.V.	Bitkom e.V. is a mainly industry-oriented network. Fraunhofer is a key contributor for industry guidelines on Big Data since 2012 with its main focus on big data architectures, visual analytics, and text mining. Social Analytics was initially addressed in the last industry guidelines (2014).	Involvement in a network of industrial and scientific partners in Germany (Bitkom e.V); setting the technological and IT standards for a broad range of industries (Task 5.1)
FRAUNHOFER	Member of the Smart Data Innovation Lab (SDIL)	German industry network on big data intelligence with its focus on business-driven data analysis bridges the gap between data science and business. The goal is	Collaboration, business cases and new real-life economical challenges (Task 5.1)

		to turn big data into smart data. Alongside leading research parties SDIL accommodates more than 20 companies including Bosch, Bayer, Siemens, and BASF	
FRAUNHOFER	Part of the Networked European Software and Services Initiative (NESSI)	European Big Data network with its focus on early access to technology and platforms to create highly relevant expert knowledge in industry and user organisations, matured application and fostered wide up-take oriented towards best practices	Pan European contact point; Involvement in key industrial networks (Task 5.1)
FRAUNHOFER	Collaboration with mobile network operators	Strategic partnership with Vodafone since 2011, joint research with Orange and NokiaSiemensNetworks/ Nokia Networks (NSN) on service usage and behavioural patterns, network interaction and optimization tasks. Trajectory analysis for activity spaces and patterns based on episodic movement data.	Collaboration with industry (Task 5.1)
FRAUNHOFER	Collaboration with media industry: OOHM in Switzerland and Germany, Online Marketing, ARD, Deutschlandfunk, Arte etc.)	Fraunhofer has direct access to key stakeholders in the market. Auditor of online advertisement networks; analysis of social data (e.g. Bosch, Wella)	Collaboration with industry (Task 5.1)
FRAUNHOFER	Collaboration with public safety authorities	Fraunhofer is a partner with the Federal Office of Civil Protection and Disaster Assistance (BBK), working on early detection of critical events in near real-time. Distributed event recognition based on data sources such as Twitter, infusion of the human-as-a-sensor principle, analysis of social groups and impacts during nation-wide disasters.	Input of end-user requirements; collaboration with stakeholders (Task 5.1)
UNIPI	Yahoo!	Design of efficient algorithms and data structures	Collaboration with industry (Task 5.1)

UNIFI	Google	Topic annotators for short texts (such as tweets, posts, news, blogs) and queries	Collaboration with industry (Task 5.1)
UNIFI	Tiscali	Web search and mining, news analytics, e-commerce sites and advertising	Collaboration with industry (Task 5.1)
CNR	ISTAT - Italian National Statistical Institute	Research collaboration for extracting relevant statistical measures of user behaviour. They provide national data about territory and citizens	Collaboration with industry (Task 5.1)
CNR	Octotelematics - (telematic provider for car insurance industry)	Octotelematics collects and manages one of the largest Worldwide GPS datasets. Collaboration for analysing vehicle trajectories	Collaboration with industry (Task 5.1)
CNR	Telecom Operators	Strategic partnership with WIND; joint research with Orange and TIM on service usage and behavioural patterns, network interaction and optimization tasks. Trajectory analysis for activity spaces and patterns based on episodic movement data.	Collaboration with industry (Task 5.1)
CNR	Toyota - IT Research Center Tokyo	Strategic partnership aimed at developing privacy aware mobility data sharing. Data from internal car sensors and user behaviour	Collaboration with industry (Task 5.1)
CNR	Data Protection Authority	The public organization responsible for managing legal aspects related to personal data. The collaboration is around providing support on national guidelines and legal aspects	Collaboration with policy makers (Task 5.1)
CNR	Public Administration (Tuscany, Rome, IRPET)	Cooperation with Italian public administrations. Provide detailed data on the territory such as sensor data and useful information about governance.	Collaboration with policy makers (Task 5.1)
CNR	UNICOOP	Strategic partnership with a big retail cooperative in Italy, for consumer categorization and behaviour classification. They provide retail data and expertise in product management and	Collaboration with industry (Task 5.1)

		advertisement	
LUH	Member of WebScience Trust (WST) and the Web Observatory network	The aim of the WebScience Trust is to globally support the development of WebScience. The aim of the Web Observatory is to (i) globally locate and describe existing data sets owned by many organisations, (ii) identify Collection Systems to gather new global data sets, and (iii) identify Analytics Tools to analyse and visualise data sets.	Participation in key international networks (Task 5.1)
SNS	UniCredit Group	Strategic partnership with the biggest Italian financial group, financed by Unicredit. Focus: networks and complex systems for finance	Collaboration with industry (Task 5.1)
SNS	HSBC	Collaboration on financial topics	Collaboration with industry (Task 5.1)
SNS	List Group	Long-running, established collaboration in financial data analysis	Collaboration with industry (Task 5.1)
SNS	Capital Fund Management	Collaboration on financial topics	Collaboration with industry (Task 5.1)
CNR-HPC	Tiscali	Collaboration around effective web page ranking	Collaboration with industry (Task 5.1)
UT	Information System Authority	Information System Authority is providing access to X-Road service execution logs for the period 2005-2015, which contain data about government service usage of all residents of Estonia. The data set is available to SoBigData researchers and trans-national access, to study phenomena related to e-government services evolution and adoption.	Collaboration with public bodies and policy makers (Task 5.1)
UT	Register OÜ	Partnership with the biggest Estonian B2B data provider for development of analytical models for credit scoring of SME-s, micro-companies and start-ups.	Collaboration with industry (Task 5.1)
IMT	Dutch National Bank	Longlasting collaboration on the topics of network reconstruction and early-warning signals detection	Expertise sharing

IMT	Bank of England	Longlasting collaboration on the topic of network reconstruction	Expertise sharing
IMT	ABN-Amro	Research collaboration on the topic of early-warning signals detection	Expertise sharing
IMT	ING	Research collaboration on the analysis of CDS time-series	Expertise sharing
IMT	Enel Foundation	Research collaboration on urban development and circular economy	Data and expertise sharing
IMT	Global Footprint Network	Analysis of Ecological footprint flows	Data and expertise sharing
UT	Breakaway Lab Ivs (Denmark)	Analysis of logs of an enterprise system using process mining	Expertise sharing
ETHZ	SIX Group, Switzerland	Cryptocurrency and blockchain research and development	Collaboration and expertise
CNR-IIT	University of Milan	in-depth/constructive exchanges on approaches, methods or results	Collaboration and expertise sharing
CNR-IIT	University of Oxford	Research collaboration on social cognitive constraints	Collaboration and expertise sharing
CNR-IIT	Innovalia	Collaboration to bring research results to SMEs	Collaboration and expertise sharing
USFD	Collaboration with policy makers	Demonstration of our tools for analysis of online abuse and disinformation to OFCOM and DCMS in the UK	Expertise sharing

2.4 INNOVATION SUCCESS INDICATORS

The success of the innovation activities were monitored closely throughout the project, as detailed below.

Engagement Target	Objective	Target	Achieved
Number of SMEs	Consulting, knowledge transfer, bespoke short projects, spin-outs	More than 20	24 20% growth
Number of bigger companies	Consulting, knowledge transfer, commercial funding	More than 10	15 50% growth
Number of policy makers	Collaborations, recommendations	More than 5	10 100% growth
Number of other institutional stakeholders	Consulting, knowledge transfer, bespoke short projects, engagement with industrial bodies	More than 10	12 20% growth

3 INNOVATION PLANNING

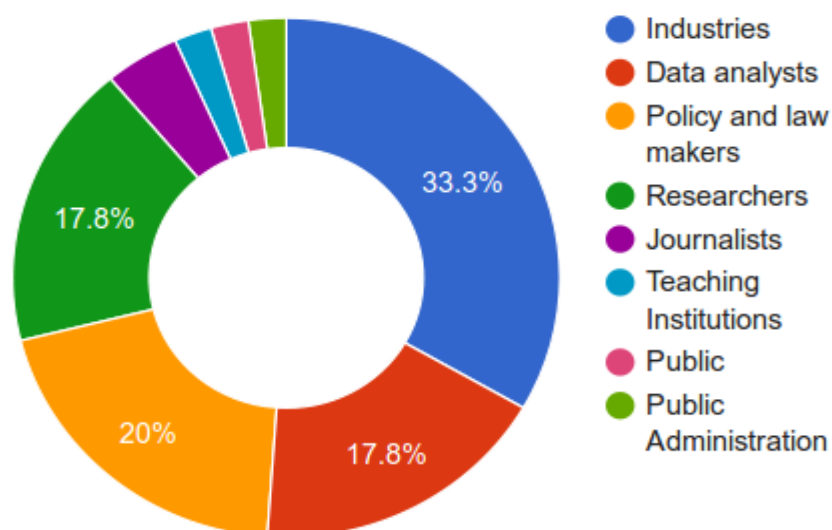
Industrial users and other stakeholders are being offered the opportunity to access a rich social data ecosystem, in a unified manner, and to conduct large-scale, multi-disciplinary experiments on extracting social knowledge. They are drawing on cutting edge open-source methods offered by leading European research centres and their infrastructures. Thanks to the open nature of the SoBigData RI, it is possible to have it developed and expanded further, in a sustainable fashion, by users and developers in the SoBigData stakeholder community, formed during the project's innovation activities.

As part of developing stakeholder specific SoBigData factsheets (D3.2), we analysed the already active stakeholder engagements in the consortium:

Application Fields	Stakeholders						
	Researchers	Industries	Policy and law makers	Data analysts	Journalists	Students	Public
<i>Computer Science</i>	24	24	14	24	15	23	17
<i>Economy</i>	13	20	14	19	13	10	8
<i>Social Science</i>	14	12	10	14	9	12	9
<i>Humanities</i>	8	2	4	8	4	8	2
<i>Medicine</i>	7	3	2	4	1	1	1
<i>Laws</i>	8	4	4	4	5	4	1
<i>Ethics</i>	3	3	3	3	2	2	2

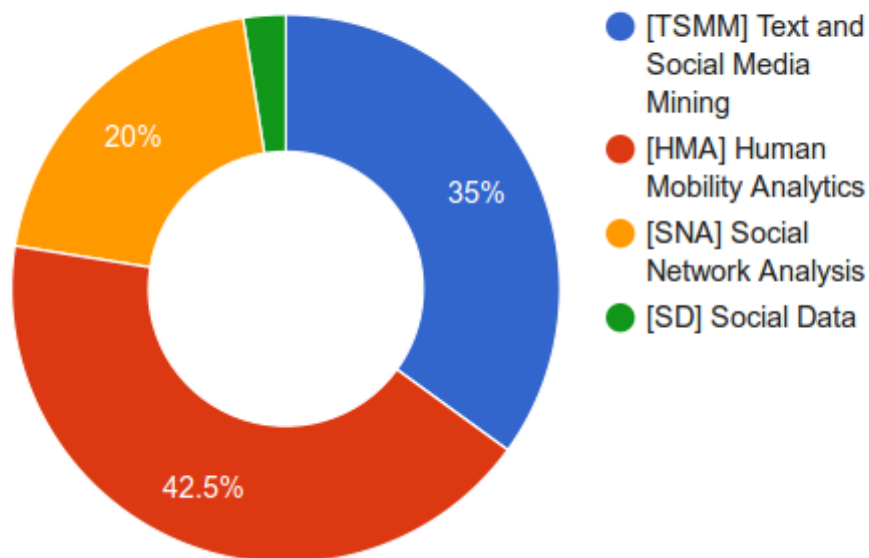
As can be seen from the following diagram, so far the primary targets of innovation activities have been companies (1/3 of all already engaged stakeholders), followed by data analysts, policy and law makers. Overall, knowledge transfer and collaborations with these three categories of stakeholders comprises just over 71% of all stakeholders currently engaged with SoBigData.

Stakeholders already involved by Type



As shown next, there is also a good balance across the four thematic clusters in SoBigData, which demonstrates that they all comprise important strands of social big data analytics. The relatively small part of the social data (SD) cluster should not be taken as an indicator for lack of importance. In fact, the data gathering tools from the SD cluster are the enabler for the analytics methods and tools in the other three clusters, and thus, are implicitly also included in their figures.

Stakeholders already involved by Thematic Cluster



3.1 IMPACT ON INNOVATION AND GROWTH OF EU BIG DATA COMPANIES

One of the foci of our innovation activities is on improving the innovation capacity and strengthening growth of European big data companies.

For instance, USFD and their GATE text-mining infrastructure are working already with data scientists and text analysts from SMEs and larger companies, who build and sell innovative products on top of the open-source tools and services.

Secondly, by open-sourcing most of SoBigData's results, we support SMEs and other companies in adopting and benefiting from the new RI. The RI helps both with their new research and development activities, and also, provides building blocks in innovative products and services. More specifically, SMEs and bigger companies have been attracted during the project, capitalising specifically on the strong commercial partnerships already in place through project partners and users of their open-source tools and national infrastructures. This currently includes over 50 SMEs and entrepreneurs worldwide, as well as the bigger organisations listed above.

The project partners have already setup or are in the process of setting up knowledge transfer and consultancy services, aimed at SMEs and bigger organisations (Task 5.2). Often companies need to tailor generic big data analytics algorithms to the specifics of their vertical or product, so the project partners

were and are still ideally placed to offer such customisation and knowledge transfer services, on top of the numerous open-source algorithms and free services provided by the SoBigData infrastructure.

In more detail, there is currently a large, untapped potential for developing new affordable, big social data analytics products and services, since many companies in diverse areas (e.g. business intelligence, market research, campaign and brand reputation management, customer relationship management, enterprise search and knowledge management) are analysing and comparing big social data, often in a labour intensive and expensive manner. This manual approach is quickly becoming infeasible, due to the continued growth of data volumes.

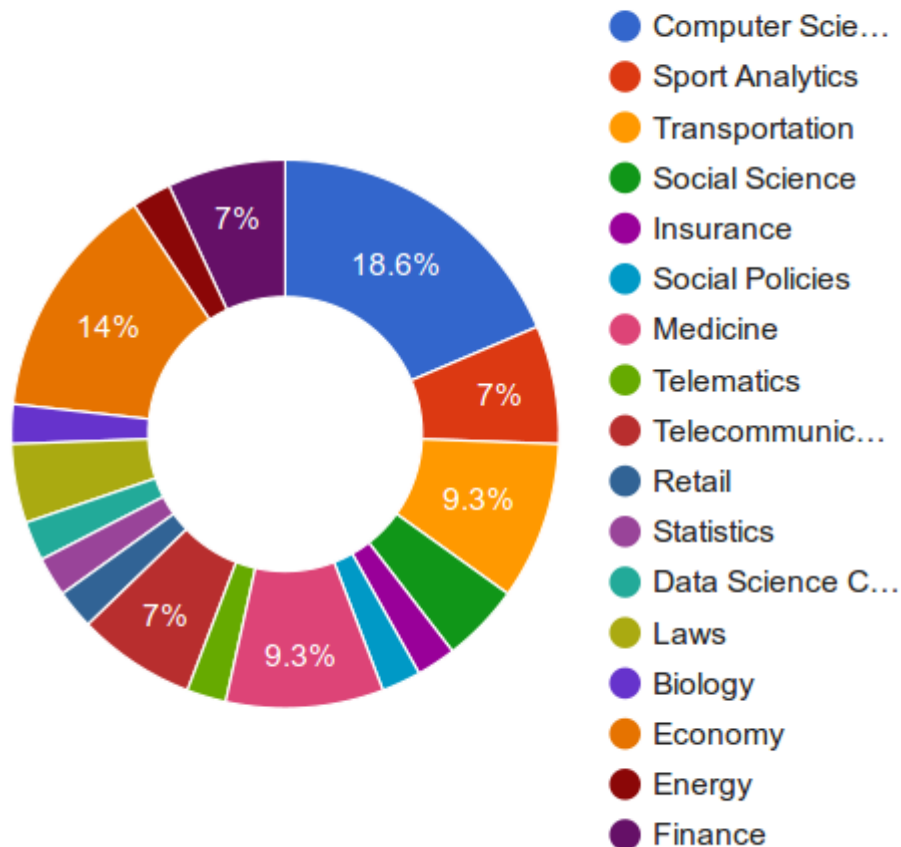
To facilitate this process, USFD have developed as part of Task 5.2 template service contracts and a template NDA. These two documents can be found in Section 5: Appendix 1; 5.1 Non-Disclosure Agreement (page 34) and 5.2 Template Service Contract (page 38).

The Non-Disclosure agreement facilitates parties to discuss initial ideas and explore working together whilst keeping any information confidential. The Template Service Contract provides a template for use where the academic institution is providing services to a company (for example, advice on how to use technology/software, together with prototypes of samples, where appropriate).

3.2 TARGET VERTICAL DOMAINS

The range of vertical domains that can be targeted through innovation activities in SoBigData is very wide. This is already demonstrated in the graph below, which summarises the fields from which the already involved SoBigData stakeholders come from.

Stakeholders already involved by Application Field



In the rest of this section we discuss some of these in more depth, but this list is by no means exhaustive and is likely to grow during the project's lifetime.

Political Analysis, PR, campaign, campaign and communication professionals: A big social data analytics platform will offer companies the chance to offer cheaper services and expand their offerings to a greater variety of customers, through being able to analyse larger data volumes. Additionally, the automated analysis can highlight to customers when trends are changing so that they can commission work at the right time. Communications consultancies could benefit similarly with respect to lower costs, faster services, and more in-depth analysis of big social data. The project is also relevant to political consultants, especially those working on pan-European level.

Customer Engagement and Market Research: Social media streams are an extremely valuable resource for companies, who stand to gain a direct insight about what customers think of their products. Information is currently gathered from focus groups or questionnaires or manually by employees whose job is to read Twitter and user forums. This suffers from high cost, poor coverage and bias. Therefore we will promote the automated SoBigData services to companies interested in using intelligent technologies, as well as companies offering bespoke products in this market. We will seek to attract further significant industrial interest and generate exploitation opportunities, firstly by presenting project results to our existing

industrial contacts and secondly, by targeting new ones through webcasts, YouTube presentations, and participation in relevant industry-oriented forums (e.g. Intelligent Content, Text Analytics, KDNuggets).

Financial and Business Intelligence: Another target are companies building products and services for financial professional communities, investors, financial authorities, and analysts. The project partners will promote SoBigData results to the business intelligence community, through existing contacts (e.g. XBRL Europe, LIST spa, MPS bank, CreditReform, Unicredit), as well as through relevant business conferences, and online communities (e.g. Business Intelligence Network, LinkedIn BI group).

eGovernment, Digital Libraries and Archives: USFD's and KCL's existing text mining tools are already used in electronic archives and digital libraries to enable semantic search, e.g. for person names and locations. For instance, recently the UK National Archives awarded USFD a contract to develop a bespoke 'intelligent discovery tool' to improve search over archived UK Government websites (around 7TB of data). In that context, the SoBigData RI will be a very cost-effective solution, which would benefit many similar institutions. USFD and LUH have also participated in the ARCOMEM project, which involved working with a number of digital libraries and archives. Further impact in this area will be achieved through KCL's digital humanities partners, and the users of the DARIAH and CLARIN e-Infrastructures, with which SoBigData will cooperate.

Official statistics: national statistical institutes, such as ISTAT, and EUROSTAT, are beginning to explore novel ways to produce high-quality statistical information using big social data sources. This trend is motivated by achieving faster and more accurate measurements of socio-economic indicators, such as employment, poverty, inequality and the various dimensions of well-being, in order to achieve a better monitoring of our societies at smaller geographical scale. CNR and UNIPI have initiated pilot projects on this line with ISTAT. SoBigData will represent an ideal environment where this high-impact line of research and development can take place, especially for the ability to access multiple big data sources and to integrate multi-disciplinary competences.

Smart cities and smart communities: big data and social mining at urban scale, when merged with traditional infrastructures, allow for new understanding of urban problems; for effective and feasible ways to coordinate urban technologies; for new models and methods for using urban data across spatial and temporal scales; for developing new forms of urban governance and organisation; for discovering critical problems relating to cities, transport, and energy; and identifying risk, uncertainty, and hazards in the smart city. CNR, UNIPI and FRH are frontrunners in the exploitation of big data analytics for smart cities, in collaboration with industry and public administration. The proposed SoBigData infrastructure has the potential to become the place for sophisticated data-driven modelling and simulation of urban innovation projects, offering novel opportunities to local and regional governments, policy makers, and citizen organizations.

3.3 NEXT STEPS

The rationale behind focusing first on industry collaborations and policy makers is that they provided us with real-world use case scenarios and requirements, as well as acted as early adopters and champions.

Guided by the discussions with these two initial target groups, we then developed several relevant case studies and used those to guide the SoBigData infrastructure and integration efforts:

- Business and Economic Performance – mining micro-scale social data to understand macro-scale business and economic phenomena
- Polarised Societal Debates – automated analysis of polarised debates in social media around “hot” policy issues (e.g. climate change, immigration, elections)
- City of Citizens – mining knowledge from city data, e.g. car pooling, urban mobility mapping, trip builder

The implementation of these case studies is based on integrating tools from several SoBigData partners into the SoBigData infrastructure, which has served also as the impetus for discussing joint innovation activities and joint collaborations with stakeholders, thus moving away from the initial 1-2-1 partner to stakeholder collaboration model.

As the project progressed and the SoBigData infrastructure matured, joint innovation activities are increasingly being pursued and will continue after the project end and into the new enlarged SoBigData++ project, ultimately including also discussions on spin outs, joint ventures, and revenue sharing.

4 CONCLUSION

This deliverable reported the innovation activities carried out within the SoBigData project, which resulted in a wide range of stakeholder engagement activities. The expertise and connections will be carried forward and innovation activities continued as part of the new SoBigData++ project.

5 ANNEX 1

5.1 TEMPLATE NON-DISCLOSURE AGREEMENT

CONFIDENTIALITY AGREEMENT

The draft confidentiality agreement template set out below is for use where the parties are looking to exchange ideas or are exploring working together and require their confidential information to be kept confidential and only used for the purpose of the discussions.

The agreement is not appropriate where the parties will be completing work/projects together. In those circumstances a more detailed agreement will be required.

The parties will need to complete the areas highlighted yellow, namely their details and the purpose of the discussions.

The agreement is drafted to be subject to Belgian law and subject to the jurisdiction of the Belgium Courts (clause 13), but these provisions can be amended, where appropriate. For example if both parties are in Italy, then it is likely that Italian law and jurisdiction would be more appropriate for the agreement.

Although we have made reasonable efforts to ensure this template is appropriate for the SoBigData project, we make no representations, warranties or guarantees, whether express or implied, that the content of this agreement is accurate, complete or appropriate for use and the template is provided for information purposes only. If you have any queries or require advice on the terms, you must take professional or specialist advice.

THIS MUTUAL CONFIDENTIALITY AGREEMENT is made on the date of the last signature to this Agreement.

BETWEEN

- (1) [The SME/Non Profit Organisation] (company number xxxxxxx) whose address is [inset address] ; and
- (2) [CONTRACTOR]] (company number xxxxxxx) whose address is [insert address]

1. In order for [add name of SME/Non Profit Organisation here] and [add name of CONTRACTOR here] (each a "party" together the "parties") to enter into discussions regarding [add field here] ("Purpose") a party may disclose ("Disclosing Party") to the other ("Acquiring Party") information and associated documentation which is secret and confidential information ("Confidential Information"). For the purposes of this Agreement "Confidential Information" means any and all information of a confidential nature or which shall be designated as confidential by the Disclosing Party from time to time and in any form or format whether oral, written, magnetic, electronic, graphic or digitised (and including any samples, designs, models, drawings, research, instructions and any combination or compilation thereof) and shall in particular include business information, technical know-how, inventions (whether or not patentable or patented), proprietary software, practical experience, methodologies, data (including technical and scientific data), business organisations, formulae, specifications, pricing, structures, manufacturing information, works of authorship or creative works and ideas which are owned, developed or acquired by the Disclosing Party.
2. In consideration of the Disclosing Party disclosing to the Acquiring Party the Confidential Information, the Acquiring Party agrees to keep it, and all information relating to it and its use, secret and confidential and not to use it for any purpose other than the Purpose, to take all reasonable steps to protect the confidentiality of the Confidential Information and to prevent it from being disclosed otherwise than in accordance with this Agreement and, except with the express prior consent in writing of the Disclosing Party, not to disclose it in whole or in part to any third party and not to make copies of any records of Confidential Information. The Acquiring Party shall not reverse-engineer, decompile, disassemble, deconstruct or modify any Confidential Information or records containing Confidential Information without the Disclosing Party's prior written permission.
3. The Disclosing Party does not represent nor warrant nor undertake that the Confidential Information disclosed hereunder is accurate or complete.
4. The Disclosing Party shall have no liability resulting from any reliance on or use of Confidential Information by the Acquiring Party. Damages for breach of this Agreement is agreed between the parties to be an inadequate remedy and the Disclosing Party shall have the right to seek such other remedies as may be available to it including but not limited to injunctive relief and/or specific performance.
5. Nothing in this Agreement shall be construed to grant either party any right or licence in any patent, know-how, trademark, copyright or other intellectual property of the other party.

6. The Acquiring Party shall disclose the Confidential Information only to such members of its staff as are necessary for the Purpose and not further or otherwise and all such members of staff or other persons shall be made aware of the provisions of this Agreement and the duty of confidentiality and be subject to obligations of confidentiality in relation to the Confidential Information to at least the level of those set out in this Agreement..

7. The restrictions above shall not apply to information which can be proved by the Acquiring Party upon the written request of the Disclosing Party:
 - 7.1 was already in the Acquiring Party's possession or independently developed by the Acquiring Party and at the Acquiring Party's free disposal prior to the Disclosing Party's disclosure of it to the Acquiring Party;
 - 7.2 was disclosed to the Acquiring Party by a third party at liberty to disclose that information and without breach of the terms of this Agreement; or
 - 7.3 is or comes into the public domain through no act or default of the Acquiring Party, its officers, agents or employees.

8. Confidential Information may be disclosed:
 - 8.1 to the extent that such disclosure is required by law, in which case the Acquiring Party will notify the Disclosing Party of such requirement as early as possible before such disclosure, and shall provide the Disclosing Party with full details of the requirement and of the Confidential Information that is proposed to be disclosed shall use reasonable endeavours to obtain confidentiality undertakings from the recipients in respect of the Confidential Information disclosed; and
 - 8.2 to Acquiring Party's auditors, lawyers and/or other professional advisors only to the extent necessary and provided that such professional advisors are themselves under obligations of confidentiality in relation to the Confidential Information so disclosed.

9. The Acquiring Party shall delete from its computer systems and shall return to the Disclosing Party all documents, records, and materials in its possession, custody or control incorporating any Confidential Information (except for one single electronic or written copy of the Confidential Information which may be retained for audit purposes):
 - 9.1 (except as otherwise agreed in writing) forthwith upon conclusion of the Purpose; or
 - 9.2 forthwith at any time on written request by the Disclosing Party; The return of Confidential Information shall not release either party from its obligations under this Agreement.

10. These obligations of confidentiality shall be effective from the date of this Agreement and remain in force for ten (10) years from the date of the last disclosure, notwithstanding earlier termination of this Agreement for any reason.

11. Both Parties shall comply with all applicable laws, regulations and sanctions relating to anti-bribery and anti-corruption and shall not give, provide or offer to the other Party any loan, fee, reward, gift (except items of negligible or intrinsic value), or any emolument or advantage whatsoever to the other Party. Non-compliance or suspected non-compliance shall constitute a material breach of this Agreement and this Agreement may be terminated by the non-breaching Party with immediate effect without prejudice to any other rights the non-breaching Party may possess.

12. This Agreement sets out the entire agreement between the parties in respect of the Confidential Information disclosed by either party to the other and supersedes all previous undertakings.

13. This Agreement shall be read and construed in accordance with Belgian law and each party hereby submits to the exclusive jurisdiction of the Belgium Courts.

14. 15. This Agreement may be executed in any number of counterparts, each of which when executed (and delivered or transmitted by electronic means), will constitute one original, and photocopy, electronic or other copies shall have the same effect for all purposes as an ink-signed original. Each party hereto consents to be bound by photocopy signatures of such party's representative hereto. No counterpart will be effective until each party has executed at least one counterpart.

IN WITNESS whereof the parties have executed this Agreement the day and year first above written.

SIGNED by

for and on behalf of **[SME/Non Profit Organisation]:**

Name:

Title:

Date:

SIGNED by

for and on behalf of **[CONTRACTOR]:**

Name:

Title:

Date:

5.2 TEMPLATE SERVICES RENDERED CONTRACT



The draft agreement for services template set out below is for use where the academic institution is providing services to a company (for example, advice on how to use technology/software, together with prototypes of samples, where appropriate).

The parties will need to complete the areas highlighted yellow, namely their details, details of the work being undertaken, project dates and the price charged.

There are also a couple of optional clauses. Clause 6.3 provides for payment to be in either sterling or euros, and this should be deleted accordingly. Further, the agreement is drafted to be subject to Belgian law and subject to the jurisdiction of the Belgium Courts (clause 16.10), but these provisions can be amended, where appropriate. For example if both parties are in Italy, then it is likely that Italian law and jurisdiction would be more appropriate for the agreement.

Although we have made reasonable efforts to ensure this template is appropriate for the SoBigData project, we make no representations, warranties or guarantees, whether express or implied, that the content of this agreement is accurate, complete or appropriate for use and the template is provided for information purposes only. If you have any queries or require advice on the terms, you must take professional or specialist advice.



Services Rendered Contract

Institution Reference:XXXXXX

Client Reference: XXXXXXXX **Date Issued:**

PART 1

CLIENT:
XXXXXXXXXXXX

[SME/Non Profit Organisation details to be added here] (“Institution”)

[Add Company number, if applicable, and address]:

Client Contact:
XXXXXXXXXXXX

Institution Contact:
Name

PART 2

Project title: XXXXXXXXXXXXXXXXXXXX

Project objectives: XXXXXXXXXXXXXXXXXXXX

PART 3

Start date: XX XXX 20 **Estimated end date:** XX XXX 20

Costs: The fee for undertaking the work required for carrying out the project is £XXX per day exclusive of VAT or any applicable taxes [for a minimum of XXX days] <Institution> shall (if applicable) add to the fee an amount equal to any VAT or other sales/applicable tax or duty at the rate applicable from time to time.

INSTITUTION'S TERMS AND CONDITIONS OF SALE PRINTED OVERLEAF SHALL APPLY EXCEPT WHERE ALTERED OR AMENDED BY THIS QUOTATION AND BY SIGNING THIS QUOTATION YOU AGREE TO BE BOUND BY THOSE TERMS AND CONDITIONS.

Signed for and on behalf of Institution

Date:

Name of signatory:

Position:

Signed for and on behalf of xxxxxxxxxxxxxxxxxxxxxx

Date:

Name of signatory:

Position:

Client VAT Number: XXXXX

1. DEFINITIONS AND INTERPRETATION

1.1 In this Contract (unless the context otherwise requires), the following words and phrases shall have the following meanings:

"Conditions" means these terms and conditions of sale;

"Services Rendered Contract" means the services rendered contract for the Goods and/or Services issued by INSTITUTION to the Client signed and stamped by an authorised signatory of INSTITUTION together with all documents referred to in it;

"Contract" means this contract for the sale of Goods and/or Services made by or on behalf of INSTITUTION with a Client which incorporates the Services Rendered Contract, these Terms and Conditions of Sale and where applicable, any proposal or statement of work attached and referenced to the Services Rendered Contract;

"Client" means the party identified as the client in the Services Rendered Contract;

"Goods" means the goods which INSTITUTION supplies pursuant to the Contract; and

"Services" means the services which INSTITUTION provides pursuant to the Contract.

1.2 In these Conditions (unless the context otherwise requires):

1.2.2 construction of these Conditions shall ignore the headings (all of which are for reference only); and

1.2.3 any reference to any legislative provision shall be deemed to include any subsequent re-enactment or amending provision.

2. APPLICATION

These Conditions shall govern and be incorporated into the Contract, and shall prevail over any terms or conditions (whether or not inconsistent with these Conditions) contained or referred to in any correspondence, order, documentation submitted by the Client or elsewhere or implied by custom, practice or course of dealing.

3. ACCEPTANCE

The Client's execution and return of the Services Rendered Contract or the execution or commencement of delivery of Goods or performance of Services, constitute the Client's acceptance of the Services Rendered Contract subject to these Conditions.

4. DELIVERY AND PERFORMANCE

4.1 INSTITUTION will use reasonable endeavours to deliver the Goods or perform the Services on the delivery or performance date specified in the Services Rendered Contract. The dates mentioned in any Services Rendered Contract or elsewhere for delivery of the Goods or performing the Services are approximate only and time for delivery or performance is not of the essence and shall not be made so by the service of any notice.

4.2 INSTITUTION will deliver the Goods or provide the Services at the premises stipulated in the Services Rendered Contract or as otherwise or agreed by INSTITUTION.

- 4.3 If the Client refuses or fails to take delivery of Goods delivered in accordance with the Services Rendered Contract or fails to take any action necessary on its part for delivery of the Goods, INSTITUTION is entitled to terminate the Contract with immediate effect, dispose of the Goods as INSTITUTION may determine and to recover from the Client any loss and additional costs incurred as a result of such refusal or failure (including, without limitation, the fee and storage costs from the due date of delivery).

5. RISK AND TITLE

- 5.1 Risk for the Goods passes on delivery but title to the Goods (whether separate and identifiable or incorporated in or mixed with other goods) remains with INSTITUTION until the Client pays to INSTITUTION the agreed price for the Goods (together with any accrued interest at the rate specified in Condition 0) and all other amounts owed by the Client to INSTITUTION in respect of any other goods or agreement.
- 5.2 Until title to the Goods passes to the Client under Condition 0 the Client shall: (a) keep the Goods separately and readily identifiable as the property of INSTITUTION; and (b) not attach the Goods to real property without INSTITUTION's consent.
- 5.3 At any time before title to the Goods passes to the Client (whether or not any payment to INSTITUTION is then overdue or the Client is otherwise in breach of any obligation to INSTITUTION), INSTITUTION may (without prejudice to any other of its rights): (a) retake possession of all or any part of the Goods and enter any premises for that purpose (or authorise others to do so) which the Client hereby authorises; and/or (b) require delivery up to it of all or any part of the Goods.
- 5.4 Any property of the Client's in INSTITUTION's possession or under its control and all property supplied to INSTITUTION by or on behalf of the Client is held by INSTITUTION at the Client's risk.

6. PRICE AND PAYMENT

- 6.1 In consideration of INSTITUTION undertaking the work set out in the Services Rendered Contract the Client agrees to pay the fees, costs and all other expenses as set out in the Services Rendered Contract.
- 6.2 The fee shall be paid without deduction of withholding or other income taxes and if subject to such deduction the Client shall pay an amount that is after deduction of such withholding or other income taxes equivalent to the fee otherwise payable under this Contract.
- 6.3 The Client shall make all payments due to INSTITUTION under the Contract [in pounds sterling/euros] within twenty-eight (28) days of the date of the relevant invoice.
- 6.4 Time of payment is of the essence of the Contract and INSTITUTION reserves the right to suspend the provision of Goods or Services to the Client where any amounts are overdue under the Contract until all such amounts have been paid.
- 6.5 The Client is not entitled to withhold payment of any amount due to INSTITUTION by way of any set-off or counterclaim.
- 6.6 If the Client fails to pay any amount due to INSTITUTION under the Contract on the due date, interest shall be added to such amount at the rate of 3% for the period from and including the date of receipt (whether before or after judgment).
- 6.7 INSTITUTION reserves the right to alter or withdraw at any time any credit allowed to the Client.
- 6.7.1 INSTITUTION may offset any amount owing to it from the Client against any amount owed to the Client by INSTITUTION.

7. INFRINGEMENTS OF THIRD PARTY RIGHTS

INSTITUTION makes no representation or warranty that the Goods or Services or advice given by its servants or agents of the use of any information provided in connection with the Contract will not result in infringement of third party rights and INSTITUTION does not accept any responsibility whatsoever for infringement of such rights. The Client shall indemnify INSTITUTION against all loss, liability and cost which INSTITUTION incurs in carrying out any work required to be done on or to the Goods or in relation to the Services in accordance with the Client's requirements or specifications which give rise to any infringement or alleged infringement of the rights of any third party.

8. INTELLECTUAL PROPERTY

- 8.1 All intellectual property other than intellectual property arising from the delivery of the Goods or performance of the Services owned or controlled by a party prior to commencement of the Contract and used in or disclosed in connection with the Contract ("**Background IP**") shall remain the property of the party introducing the same and nothing contained in this Contract shall give any right, title or interest in or to the Background IP of the other party save as granted by these Conditions. The Client shall grant to INSTITUTION an irrevocable royalty free licence to use such of its Background IP as may be necessary to effect delivery of the Goods or performance of the Services.
- 8.2 If INSTITUTION or its employees or agents deliver the Goods or perform the Services pursuant to the Services Rendered Contract, any intellectual property rights created solely and exclusively in relation to such Goods and Services pursuant to the Services Rendered Contract shall vest in the Client. The Client hereby grants to INSTITUTION an irrevocable royalty-free licence to use any and all such intellectual property for academic teaching and research purposes, including but not limited to academic publications, but not for commercial exploitation.

9. WARRANTY AND LIABILITY

- 9.1 INSTITUTION will exercise reasonable care to ensure the accuracy of the advice, information and drawings provided in connection with the Contract but accepts no liability whatsoever in respect of any claim or claims arising from the use by the Client or by any third party of any such advice, information or drawings.
- 9.2 INSTITUTION is not liable for: (a) non-delivery or non-performance unless the Client notifies INSTITUTION of the claim within fourteen (14) days of the date of INSTITUTION's invoice; or (b) shortages in quantity delivered unless the Client notifies INSTITUTION of a claim within fourteen (14) days of receipt of the Goods.
- 9.3 Except as set out in this Condition 0, all conditions, warranties and representations, expressed or implied by statute, common law or otherwise, in relation to the supply, non-supply or delay in supplying the Goods and Services are excluded to the extent permitted by law.
- 9.4 Subject to the provisions in Condition 0 below, INSTITUTION is not liable to the Client in contract, tort (including negligence or breach of statutory duty) or otherwise for any indirect, special or consequential damages and loss sustained arising out of, or in connection with, the supply, non supply or delay in supplying the Goods and Services or otherwise in connection with the Contract.
- 9.5 Subject to Conditions 0 and 0, the entire liability of INSTITUTION arising out of or in connection with the supply, non supply or delay in supplying the Goods and Services, or otherwise in connection with this Contract, whether in contract, tort (including negligence or breach of statutory duty) or otherwise, is limited to the price paid by the Client under the Contract.
- 9.6 Nothing in this Contract shall operate to exclude or restrict INSTITUTION's liability for: (a) death or personal injury resulting from negligence; (b) fraud or deceit or (c) any liability that cannot by law be excluded.

10. TERMINATION

- 10.1 INSTITUTION may terminate the Contract if circumstances beyond its control make delivery of the Goods or performance of the Services materially different to, or uneconomic compared with, that reasonably contemplated by INSTITUTION at the date of entering into the Contract by giving thirty (30) days notice to that effect to the Client.
- 10.2 On or at any time after the occurrence of any of the events in Condition 0, INSTITUTION may stop any Goods in transit and/or suspend further deliveries to the Client or performance of the Services; exercise its rights under Condition 0; and/or terminate the Contract forthwith by giving notice to that effect to the Client.
- 10.3 The events are: (a) the Client being in breach of any obligation under the Contract; or (b) the Client becomes bankrupt or in the case of a body corporate becomes insolvent.
- 10.4 On termination of the Contract pursuant to Condition 0, 0 or 0, any indebtedness of the Client to INSTITUTION shall become immediately due and payable and INSTITUTION is relieved of any further obligation to supply Goods or perform Services to the Client pursuant to the Contract.
- 10.5 Where termination occurs in accordance with Condition 0 then all rights relating to intellectual property shall terminate and all intellectual property shall revert to INSTITUTION. Where required in the reasonable opinion of INSTITUTION, Client or its successors in title shall do all things requested by INSTITUTION to facilitate full assignment to INSTITUTION.

11. PUBLICATION

Neither INSTITUTION or the Client shall use the name of the other in any publicity material nor publish anything relating to the work undertaken pursuant to the Contract without the prior written permission of the other (such permission not to be unreasonably withheld or delayed). Title to and the right to determine the disposition of any copyrights or copyrighted material in journals, theses, dissertations or other such published materials produced in connection with this Condition 0 shall remain with the publishing party.

12. CONFIDENTIALITY

- 12.1 Each party ("**Receiving Party**") shall treat all product, customer or business information, drawings, designs and specifications submitted to it by the other ("**Disclosing Party**") as confidential and shall not disclose it to any third party without the Disclosing Party's prior written consent or use it for any purpose other than in connection with the project to which the Contract relates. Notwithstanding earlier termination of this Contract for any reason, these obligations of confidentiality shall remain in force for ten (10) years from the date of last disclosure.
- 12.2 Condition 0 does not apply to information which: (a) is at the date of disclosure or becomes at any time after that date publicly known other than by the Receiving Party's breach of this Condition; (b) can be shown by the Receiving Party to the Disclosing Party's satisfaction to have been known by the Receiving Party before disclosure; (c) is or becomes available to the Receiving Party otherwise than from the Disclosing Party and free of any restrictions as to its use or disclosure; or (d) is required to be disclosed by law.

13. HEALTH AND SAFETY

The Client will take any steps specified by INSTITUTION from time to time to ensure that the Goods are safe and without risks to health at all times when they are being stored, used, cleaned or maintained by any person at work, or when they are being dismantled or disposed of.

14. BRIBERY

The parties shall comply with all applicable laws, regulations and sanctions relating to anti-bribery and anti-corruption. Non-compliance or suspected non-compliance shall constitute a material breach of this Contract and this Contract may be terminated by the non-breaching party with immediate effect without prejudice to any other rights the non-breaching party may possess.

15. FORCE MAJEURE

- 15.1 In this Condition 0, "**Force Majeure Event**" means any circumstance beyond the control of INSTITUTION including, but not limited to, acts of God, fire, explosion, adverse weather conditions, flood, earthquake, terrorism, riot, civil commotion, war, hostilities, strikes, work stoppages, slow-downs or other industrial disputes, accidents, riots or civil disturbances, acts of government, lack of power and delays by suppliers or materials shortages but, for the avoidance of doubt, nothing shall excuse the Client from any payment obligations under this Contract.
- 15.2 If INSTITUTION is prevented, hindered or delayed from or in supplying the Goods or performing the Services under this Contract by a Force Majeure Event INSTITUTION may, at its sole option, and without being liable for any loss or damage suffered by the Client as a result (a) suspend deliveries or performance while the Force Majeure Event continues; and/or (b) apportion available stocks of Goods between its customers if INSTITUTION has insufficient stocks to meet orders; and/or (c) terminate the Contract forthwith by giving notice to that effect to the Client.

16. GENERAL

- 16.1 The Client may not assign or deal in any way with all or any part of the benefit of, or its rights or benefits under, the Contract without the prior written consent of INSTITUTION.
- 16.2 Any notice given by one party to the other in connection with the Contract must be in writing and may be delivered personally or by pre-paid first class post to the address on this Services Rendered Contract.
- 16.3 For the avoidance of doubt, these Conditions take precedence over any other terms and conditions issued for the delivery of these Goods or performance of the Service.
- 16.4 If any part of this Contract is found by any court or administrative body of competent jurisdiction to be invalid or unenforceable, such invalidity or unenforceability shall not affect the other parts of the Contract which shall remain in full force and effect.
- 16.5 If any part of this Contract is so found to be invalid or unenforceable but would cease to be invalid or unenforceable if some part of the provision were deleted, the provision in question shall apply with such modification as may be necessary to make it valid and enforceable.
- 16.7 INSTITUTION's rights shall not be prejudiced, waived or affected by any time, forbearance or indulgence extended by I NSTITUTION to the Client, its servants or agents.
- 16.8 The Contract, together with the documents it refers to, supersedes any previous agreement and constitutes the entire agreement between the parties for the supply of the Goods or performance of the Services and takes precedence over any purchase order terms and conditions issued for the Services. Any variation shall be in writing and signed by authorised signatories for both parties.
- 16.9 Each of the parties acknowledges and agrees that in entering into the Contract it does not rely on, and shall have no remedy in respect of, any statement, representation, warranty or understanding (whether negligently or innocently made) other than as expressly set out in the Contract. The only remedy available to any party in respect of such statement, representation, warranty or understanding shall be for breach of contract under the terms of the Contract.

- 16.10 The Contract and any matter arising from or in connection with it shall be governed by and construed in accordance with [Belgian law]. Each party irrevocably agrees to submit to the exclusive jurisdiction of the [Belgium courts] over any claim or matter arising from or in connection with the Contract.
- 16.11 The Contract and any variation will only be valid if signed and stamped by an authorised signatory of INSTITUTION.
- 16.12 The Contract may be executed in any number of counterparts, each of which when executed, will constitute one original, and photocopy, electronic or other copies shall have the same effect for all purposes as an ink-signed original.