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Final sustainability plan for the big data community

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PREFACE

The BYTE project will assist European science and industry in capturing the positive externalities and diminishing the negative externalities associated with big data in order to gain a greater share of the big data market by 2020. The project comprises three phases of work: a preliminary investigation, an exploration of present and future societal impacts, and the future agenda for big data.

This deliverable captures the results of part of the activity performed in phase three, within *Work Package 7 – The big data community* (WP7), namely in *Task 7.2 – Implementation plan for the big data community*.

The overall objectives of WP7 are:

1. To design and form the big data community, including drafting founding texts
2. To prepare a BYTE project final report, including a series of guidelines supported by community members
3. To input BYTE findings and guidelines into relevant networks.

The above task and this deliverable contribute to objective 1. As per the Description of Work, Task 7.2 would consist in outlining a plan for the development, goals and long-term sustainability of the community designed by *Task 7.1 – Forming the big data community*, including a funding plan to ensure that the community remains active after the close of the BYTE project, at least until 2020. Following the reviewers' recommendations in the BYTE Year 1 Review report¹, the BYTE consortium amended Task 7.2, to also address the community impact strategy, leveraging on the work of WP8 and WP9 (led by NUIG and UIBK), with the involvement of TRI and all other partners, to ensure robustness and coherence with the other BYTE work packages.

The work has addressed an impact strategy and a development plan for the big data community, along with measures to sustain it in terms of its evolution, to ensure its continued efficiency

¹ Recommendation 3 in the First Review Report reads: “Create a new document (called “Impact Strategy”) which is addressing specifically the strategy used by the project and the implementation measures done to involve the main stakeholders in order to create a significant Big Data Community, which will have to remain active also after the termination of the project.”

The Year 1 Review report also recommended that all partners should be involved in the creation of this strategy and that one partner be responsible for its implementation. Although the report suggested that this impact strategy should be formulated within dissemination, the consortium have agreed that it would be most appropriate to situate it within WP7, as directly related to the big data community.

Task 7.2 has been judged ideal for this activity for three reasons:

1. First, it already relates to the governance structure, membership criteria and goals of the organisation. This has been augmented to include a specific strategy to identify the correct stakeholders to engage, how to contact them and how to incentivize their participation;
2. Second, the task already foresees the involvement of UIBK who is leading the dissemination work, and NUIG who is leading the stakeholder engagement work, and both dissemination and stakeholder engagement activities are central to the development of this strategy;
3. Finally, the task feeds into D7.1.1 and D7.1.2, the Interim and Final strategy and charter for the Big Data Community, which is the most appropriate place to explicate the impact strategy.

and effectiveness. Furthermore, the work has outlined a set of possible additional funding opportunities to sustain the community financially, for the three identified implementation strategies.

The task results have been captured in deliverable *D7.1.2 – Final strategy and charter for the big data community* and in this companion deliverable *D7.2.2 – Final sustainability plan for the big data community*.

This document supersedes deliverable *D7.2.1 – Interim sustainability plan for the big data community* and follows up to:

- the Year 2 Review of BYTE, in particular elaborating further on how BYTE will guarantee sustainability of the big data community after the project ends;
- the Year 3 Review of BYTE, in particular providing a list of action items, expected results and actors that will deliver them, with associated timeline, risks and contingency plan, should the expected results not be met; a detailed strategy to seek, motivate and engage the stakeholders of interest in the European Big Data market; objective metrics and performance indicators, to measure if the expected results are obtained.

EXECUTIVE SUMMARY

BYTE has culminated in the launch of the BYTE Big Data Community (BBDC), a sustainable, cross-disciplinary platform that will implement the roadmap identified within the project, and will assist the European stakeholders in identifying and meeting the big data challenges, to finally achieve the scenario envisioned by BYTE for 2020.

Continued engagement and dialogue with stakeholders are key success factors for the implementation of a European research and policy roadmap for big data and to achieve the BYTE vision. Hence, the BBDC will be sustained also after the close of the BYTE project, at least until 2020.

This document identifies possible measures to sustain the BBDC for its anticipated time of operation, including a letter of intent by committed members (among whom, the partners of the BYTE consortium), a resource plan and a list of possible additional funding opportunities. It also details a strategy to seek, motivate and engage the stakeholders of interest in the European Big Data market, with objective metrics and key performance indicators. It outlines measures to sustain the possible future evolution of the BBDC, to ensure its continued efficiency and effectiveness. Finally, it sketches future action items, with associated timeline, risks and contingency plans, for the expected time of operation of the BBDC, that is until 2020.

1. INTRODUCTION

As per its Description of Work (DoW), BYTE has culminated in the launch of the BYTE Big Data Community (BBDC), a sustainable, cross-disciplinary platform that will implement the roadmap identified within the project, and will assist the European stakeholders in identifying and meeting the big data challenges, to finally achieve the scenario envisioned by BYTE for 2020, reported in deliverable *D5.1 – The BYTE vision*.

In the third phase of its development, BYTE has started cultivating an extensive and diverse group made up of traditional big data stakeholders, such as industrial actors, statisticians, standardisation bodies and policy-makers, computer scientists, and other science experts. Given its focus on societal externalities, also social science scholars and open data activists have been engaged, to create a shared vision and roadmap for future investments based on concrete challenges. To appropriately consider public perceptions and aspirations, as well as recommended during the Year 2 Review of BYTE, the consortium has decided to position the community in the special area of Non-Governmental Organisations (NGOs), Non-Profit Organisations (NPOs), Civil Society Organisations (CSOs), citizens, inter-governmental organizations and actors of the third sector in general, so as to be unique and have a chance to have a real impact, avoiding duplication of efforts with other initiatives.

The BBDC will monitor progress in meeting societal challenges associated with big data, capturing opportunities, provide support where necessary and identify new and emerging externalities to be addressed. Furthermore, the BBDC will facilitate a shared understanding of concrete problems and opportunities worth investigating, and suggest approaches for cooperative problem solving and collaborations across different disciplines and stakeholder categories both now and in the future. The community members will support and implement the BYTE guidelines and recommendations on capturing and addressing the positive societal externalities associated with use of big data, laid out in BYTE deliverable *D7.3 – Final report and guidelines*.

Besides creating a vital collaborative mechanism to build consensus on the recommendations identified by the BYTE project, the BBDC will also help European decision-makers to assess policies and practices across Europe, and benefit from feedback from the long-term engagement of key stakeholders. In fact, although the Commission has already supported a number of organisations designed to gather stakeholders together to assist in capturing big data innovations, these other organisations are focused on the technical and infrastructural elements of big data innovations, not the societal externalities that the BBDC addresses.

In this context, continued engagement and dialogue with stakeholders are key success factors for the implementation of a European research and policy roadmap for big data and to achieve the BYTE vision. Hence, the BBDC will have to be sustainable also after the close of the BYTE project. As per the BYTE DoW, in addition to ensuring that the project website remains in place for at least a year after the completion of the project, the consortium will also ensure that the BBDC remains active at least until 2020.

The next chapter summarises the various strategic options identified for the BBDC in the course of the BYTE project. Based on these options, the following chapter outlines some

measures to sustain the BBDC, operationally and financially, defining a resource plan and identifying a list of possible additional funding opportunities. The chapter has been further revised and updated following the Year 2 and the Year 3 Review of BYTE, expanding on how the BYTE consortium will guarantee continued operations of the BBDC after the project ends. In particular, BYTE consortium members have attained the status of Full Members in the BBDC, abiding to the letter of intent included in Annex A, as per the attached signed documents (see Annex B).

As a requested addition following the Year 3 Review of BYTE, the following chapter details the BBDC strategy to seek, motivate and engage the stakeholders of interest in the European Big Data market, introducing objective impact metrics and performance indicators, to measure if the expected results are obtained.

The subsequent chapter elaborates on the possible evolution of the BBDC, outlining some possible measures to accommodate and control it, so as to ensure its continued efficiency and effectiveness.

Finally, the last chapter identifies future action items for the expected time of operation of the BBDC, that is until 2020, with expected results and actors that will deliver them, associated timelines, risk assessments and contingency plans.

2. CONTEXT

This chapter summarises the various strategic options identified for the BBDC in the course of the BYTE project. The sustainability plan of the BBDC, which is the object of this document, is inherently dependent on the strategy chosen for implementing the BBDC itself, which in turns dictates its charter and its development plan. Hence, this document is intended as the companion of deliverable *D7.1.2 – Final strategy and charter for the big data community*².

The partners involved in WP7 have investigated the context and background in which the BBDC will operate, surveying the main initiatives and projects related to big data in Europe and the world, and identifying the most relevant to the project objectives. D7.1.2 identifies three possible distinct approaches that the BYTE consortium has considered to create and initiate the BBDC:

1. Autonomous community – means setting up a totally new and independent community to put forward the BYTE recommendations, vision and roadmap; we also refer to this approach as to the “Stand-alone” option;
2. Umbrella organisation – means gathering the existing efforts into some sort of unifying federation that would coordinate their efforts, as far as they are concerned with the objectives of BYTE; we also refer to this approach as to the “Federal” option;
3. Contribution to an existing initiative – means establishing a link and a close collaboration with one of the existing initiatives, trying to gain trust and influence on the aspects of interest to BYTE goals, so as to steer its governance accordingly. Under this perspective, it may be foreseeable (or even desirable, as an indication of full success), that the BBDC eventually merge into the chosen initiative; we also refer to this approach as to the “Join & Merge” option.

The following table summarizes the main factors of the three above hypotheses according to a SWOT analysis approach, i.e., in terms of its inherent positive/negative implications (Strengths and Weaknesses), as well as in terms of the external factors which may reinforce or diminish its effectiveness (Opportunities and Threats).

Table 1 – implications of the three main BBDC strategies

	1-Autonomous	2-Umbrella	3-Contributor
Strengths	Complete freedom to organize activities and goals	Scalability and flexibility	Direct and immediate influence
Weaknesses	Significant effort for creation and maintenance	Impact on members is indirect and mediated	Must adapt to existing governance, etc.
Opportunities	Build the BYTE reputation around societal issues as a core focus	Reach many stakeholders	Leverage/optimize existing resources

² Bigagli, Lorenzo, *et al.*, Final strategy and charter for the big data community, BYTE D7.1.2, January 2017.

Threats	There are already many organizations	Mass of BYTE may be insufficient to attract enough parties	Limited willingness to cooperate and/or limited impact of the chosen initiative
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After an evaluation of the respective pros and cons³, the BYTE consortium has taken as a first-choice hypothesis that the BBDC channel its contribution through the Big Data Value Association (BDVA) and has begun a process of exploring such collaboration with the BDVA steering committee. The BDVA is a large organisation of big data practitioners from industry, academia and other sectors. Currently, it has approximately 150 members and organises itself via regular small and large summits. In addition, the organisation also has 10 task forces, including a community task force and a legal and social issues task force. In each of these task forces, members meet regularly to identify key challenges and opportunities about big data practice and use these to set priorities for big data research.

The BDVA's principal contribution to European policy on big data is through the Big Data Value Strategic Research and Innovation Agenda (BDV SRIA; SRIA in short), which is used directly to inform the research work programme of the relevant Unit within DG Connect. BDVA members, task forces and participants are regularly encouraged to contribute to the annual updating of the SRIA and the work programme.

Based on the chosen strategy for the BBDC, D7.1.2 outlines its charter and illustrates the plan followed for its development, from the foundation to the end of the BYTE project. The next chapters elaborate on the sustainability, the impact, and the evolution of the BBDC (also with reference to the other two strategic options above). The last chapter of this document lays out the development plan for the BBDC in the future years, until 2020.

³ *Ibidem*, §3.

3. SUSTAINABILITY OF THE BIG DATA COMMUNITY

As stated in D7.1.2 and in the project DoW, a key objective of the BBDC is the implementation of the BYTE policy and research roadmap, to achieve the BYTE vision for 2020. This chapter outlines some measures to sustain the BBDC, operationally and financially, defining a resource plan and identifying a list of possible additional funding opportunities. The chapter has been further revised and updated following the Year 2 and the Year 3 Review of BYTE, expanding on how the BYTE consortium will guarantee continued operations of the BBDC after the project ends. In particular, BYTE consortium members have committed to guarantee the sustainability of the BBDC by attaining the status of Full Members of the BBDC, abiding to the letter of intent included in Annex A (see the attached signed documents in Annex B). As requested at the Y2 Review, a specific task force has been created to ensure coherence, alignment and continuity to the fundamental components of the project, i.e. the vision, the roadmaps and the community.

The next two chapters elaborate on how the BYTE consortium will guarantee that the BBDC remain active after the project ends. The following chapter outlines possible additional funding options that may be exploited to that end. The sustainability plan aligns with the final strategy for the BBDC, which is reported in deliverable D7.1.2.

3.1 CONTINUITY OF BBDC OPERATIONS AFTER THE END OF BYTE

In line with the selected strategy of Join & Merge, the operations of the BBDC will be closely coordinated with the BDVA. In particular, the BBDC focus areas will be decided jointly with the BDVA, preferably during an annual co-located meeting (e.g. the BDVA annual Summit). Besides, the BBDC will leverage all the possible synergies with the appropriate BDVA Task Forces: *TF3: Community*, *TF5/9: Legal/Societal*, including possible meetings, allocation of resources, personnel, support tools, etc.

To guarantee such effective coordination, key BYTE members have joined the BDVA, and vice versa: NUIG and SIEMENS were already members (in fact, founding members); INRIA is a member, as well as Trilateral, which is leading the Sub Group *TF3-SG3: Stakeholder platform for the societal issues*; CNR has been officially accepted during the BDVA General Assembly, on November 30th, 2016. All other BYTE partners have been invited to join the BDVA and commit to keep their BDVA membership at least until 2020.

Conversely, key BDVA members, such as the Vice-Secretary General, a Vice President, the leaders of TF3 and TF5/9, the leader of research activities and SRIA are among the BBDC founding members.

These tight links between the BDVA and the BBDC, along with the fundamental importance of the BDVA in the European strategy for big data (the BDVA is the private counterpart in the Big Data contractual Public-Private Partnership (cPPP) established in 2014 between the EC and industry and research organisations), will ensure that the BBDC continue its operations after the end of the BYTE project.

3.2 RESOURCE PLAN

The resources required for the operations of the BBDC should be provided by its stakeholders. These primarily include the members of the BBDC, as well as the subscribers of the Big Data cPPP, that is the BDVA and the EC.

In the near future, we consider a reasonable expectation that the BDVA support the BBDC in its effort to engage Civil Society in the European debate on big data. Actually, the BDVA is already directly addressing societal concerns (though arguably from a mostly technical perspective, insofar), also for their obvious connections to customer satisfaction and marketing issues. We would also reasonably expect that the EC pledge itself to specifically support the engagement of NGOs, NPOs, CSOs, citizens, inter-governmental organisations and the third sector in general, where the BBDC is positioned, in the governance of the predicated “big data revolution”. However, at the time of writing this sustainability plan, no assumptions can be made in these regards.

As for the membership of the BBDC, it is unlikely that it will be able to self-sustain the community, in the long-term. In fact, the BBDC is mainly targeted at civil society organizations, which must allocate their scarce resources prioritizing their core mission. However, this could be a viable solution for starting up the community, while organising for other sources of support. Note that volunteer, in-kind work is a most common modality of collaboration within and between organisations in the third sector, with proven effectiveness and efficiency.

In that regards, the BBDC is fully aligned with its main target context: the BBDC charter introduces the category of Full Member, who not only participates regularly, but also commits resources into the activities of the BBDC, hence guaranteeing its sustainability. Such level of support entails participation in monthly teleconferences, research/consultation work on the selected yearly focus areas, coordination and management, a yearly summit and/or dissemination events for the society. An estimation of the annual effort allocated by a Full Member is:

- 0,75 PM for coordination and research/consultation activities;
- 1-2 days for a meeting in the EU.

All the 11 members of the BYTE consortium have attained the status of Full Members of the BBDC, abiding to the letter of intent included in Annex A (see the attached signed documents in Annex B). At present, the BBDC membership includes 7 other Full Members (this figure may grow, as the BBDC membership is currently being restructured along the categories introduced by D7.1.2). According to the above estimation, the yearly aggregated resources made available by these members would amount to 13,5 PM and 18-36 days of physical meeting attendances. These resources are considered sufficient to guarantee the operations of the BBDC.

3.3 Additional funding opportunities

In addition to volunteer, in-kind work contributed by the membership, specific additional funding opportunities may be pursued to help sustaining the BBDC, if considered necessary.

Depending on the final strategy for the BBDC, some options may be more viable than others. The most likely effective funding options are indicated in Table 2.

Table 2 – possible additional funding options for the BBDC as a
1) Stand-alone community; 2) Federal community; 3) Join & Merge community

Possible funding options	1	2	3
Cooperation agreement with another community (e.g. BDVA)		X	X
Corporate/Government Sponsorship	X	X	X
EU funding – can originate from several sources: EU Agencies, EU Institutions, EU Commission and/or EU Parliament delivering frame contract services; advisory, assist with specific regulatory development, implementation, enforcement, monitoring and reporting, in particular: • H2020 Program – the work programmes are published regularly, and typically have a detailed 2-year time plan including topics, calls, deadlines, etc. The current work programme for 2016-2017⁴ has been published and opened its calls in October 2015. The key funding sources from this work programme for the BYTE community are expected to come from the calls that are relevant to Big Data PPP (in the 5i. Information and communication technologies (ICT) objectives): ○ ICT-14-2016-2017: Big Data PPP: cross-sectorial and cross-lingual data integration and experimentation ○ ICT-15-2016-2017: Big Data PPP: Large Scale Pilot actions in sectors best benefiting from data-driven innovation ○ ICT-16-2017: Big data PPP: research addressing main technology challenges of the data economy ○ ICT-17-2016-2017: Big data PPP: Support, industrial skills, benchmarking and evaluation ○ ICT-18-2016: Big data PPP: privacy-preserving big data technologies Big data is also explicitly mentioned in certain other schemes, e.g. in cooperation with non-EU countries (such as Japan) and in CSAs like the ones on prize schemes. Calls from the Societal Challenges funding pillar may be of relevance (in energy, transport, health, etc.) In most cases that will imply that the BYTE community members will not be working directly with each other, but more with other		X	

⁴ http://ec.europa.eu/research/participants/portal/desktop/en/funding/reference_docs.html#h2020-work-programmes-2016-17

communities. However, it also has also a positive impact in terms of adoption and cross-fertilisation - provided that the community will still be sustained e.g. by work in other joint projects, as well as at events such as EDF, and technology conferences e.g. SEMANTiCS, ESWC. Calls focused on research excellence may be of relevance for some members. In general, the BBDC may take a facilitator role in any EU Program addressing big data and societal externalities			
Funding from EU Member States and their local government agencies, authorities and initiatives delivering frame contract services (stipend); advisory, assist with specific regulatory development, implementation, enforcement, monitoring and reporting		X	
Annual membership fee and member contributions – there could be different membership categories and thus different fee levels (cf. BDVA). Moreover, members of the community may contribute with resources to meetings and work groups	X	X	X
Crowdfunding – for specific projects, crowdfunding practices in which monetary contributions are raised from large number of people or groups, might be suitable. This funding practice is especially useful to engage citizens and foster civil society ideals. ⁵ In addition, the community could also endorse affine related third-party projects and help them in their crowdfunding campaigns	X		
Conference fees – organizing Signature Seminars and Conferences		X	
Standardization Bodies – Facilitator of International big data Standardization Programs via ISO, ANSI, W3C, IEEE and others		X	
Business Areas – Facilitator for Joint Industry Programs (JIPs) for big data in Automotive, Defence, Oil & Gas, Energy, Transport and other sectors		X	
Service fees – the BBDC could provide a variety of services to the members and charge hourly fees for these. Examples include:			
• Partnering in other big data Communities EU work programs, i.e. H2020	X		
• Identifying and solving Societal Externality challenges	X	X	X
• Identifying and solving Big Security (big data and Cyber Security) challenges	X		
• Liaise to help European and non-European programs and initiatives to connect, be informed and collaborate		X	
• Contracting services	X	X	
• Public Relation and communication services: - Top 100 big data Projects Ranking List - Top 10 big data Challenges Ranking List - Big Data Service Providers Catalogue		X	
• Training services	X		

⁵ Hollow, Matthew. Crowdfunding and Civic Society in Europe: A Profitable Partnership? *Open Citizenship*, Vol. 4, No. 1 (2013), pp. 68-73.

• Market big data solutions	X	X	
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The Stand-alone scenario is based on the concept of a community specialized in societal externalities: the BBDC would develop services and attract members with this focus. Its funding would therefore be primarily based on membership fees, member contribution and delivery of services.

The Federal scenario is based on the concept of an umbrella community where the BBDC holds the contact network together, facilitates activities and finds the right expertise for solving problems. The specialists are found among its member organizations. The BBDC would therefore be funded from membership fees, member contributions, stipend from EU and Nations and all types of facilitation, activity building, marketing and communication.

The Join & Merge scenario is dependent on the willingness of the target organization (i.e. the BDVA) to attract new members with an interest in societal externalities, network with EU Communities and National Governments, building services and expertise. Funding can therefore include almost anything. Sources of funding would obviously be based on the charter, mission, expected costs and resources.

Since option 3 (Join & Merge) has been identified as the preferred strategy, with one of its benefits being the possibility to use already existing resources and infrastructure, the funding options would be based on the funding opportunities of the already existing community. In case of a future fall back to an alternative option, this list of opportunities will need to be developed into a full-fledged funding plan. Note that the funding opportunities are not limited to the suggested ones in the table, others may also be viable. Reality might also demonstrate that funding opportunities could serve more scenarios than what they are marked for. Depending on the evolution of the BBDC and of its value proposition towards potential participants, the assessment of what financial contributions to expect and from who may also evolve.

4. IMPACT OF THE BIG DATA COMMUNITY

BYTE recognises that responsible innovation requires the participation of civil society, in addition to industry, academia and government, in the EU strategy for big data innovation. Sustained stakeholder engagement is a key success factor to implement a European research and policy roadmap for big data and to achieve the BYTE vision, which is the mission of the BBDC.

To that end, BYTE has elaborated a strategy to maximise the impact of the BBDC on the European big data market. As requested during the Year 1 Review, such BBDC impact strategy focuses on the identification of the stakeholders to engage, how to contact them and how to incentivise their participation, both in general and at key stages of development. As requested during the Year 2 Review, the strategy includes incentive mechanisms to facilitate the active participation of the stakeholders of interest in the BBDC. As a requested addition following the Year 3 Review of BYTE, this chapter further details the BBDC strategy to seek, motivate and engage the stakeholders of interest in the European Big Data market, introducing objective impact metrics and key performance indicators, to measure if the expected results are obtained.

As underlined in the project DoW, stakeholder engagement and dissemination are crucial to the success of BYTE and its community.⁶ The impact, within the scope of this document, is defined as the demonstrable contribution made by the BYTE project. Stakeholder engagement and dissemination activities lead towards such contributions to the BBDC. Integration of stakeholders across various sectors, within the BYTE project, will facilitate knowledge exchange. Sharing of information about challenges and strategies will enable learning opportunities for stakeholders, thus incentivising long-term stakeholder engagement in the future via the BBDC. Furthermore, it will help developing effective strategies for dealing with positive and negative externalities.

The primary goal of the impact strategy is to raise awareness of the BBDC among stakeholders and other actors relevant to big data ecosystem in Europe. The stakeholder engagement activities will lead to the creation of the BBDC. The impact strategy is aimed to maximise the number of stakeholders who become aware of BYTE activities, recommendations, and the BBDC. The tools to be employed for generating impact will not be limited to mass-mailed notification. Stakeholder engagement and dissemination will be done through tools such as workshops, public talks, social media, etc.

The specific objectives of impact strategy to encourage participation in the BBDC are:

- Identification of key stakeholders and development of a stakeholder taxonomy;
- Engagement of stakeholders throughout the key stages and events of BYTE;
- Dissemination of BYTE/BBDC outcomes through various channels.

The remaining of this chapter describes parallel, synergetic activities undertaken as part of BYTE WP8 (*Stakeholder engagement*) and WP9 (*Dissemination*). The next chapter introduces a set of high-level categories of stakeholders, while the following summarizes the engagement

⁶ BYTE Description of Work, Overall strategy and work plan, p.66.

activities undertaken as part of the impact strategy. Subsequent chapters elaborate on the BBDC incentive mechanisms, impact assessment and associated key performance indicators used to measure the progress of BBDC development.

4.1 STAKEHOLDER TAXONOMY

The first objective of the impact strategy is met with deliverable *D8.1 – Stakeholder taxonomy*, which defines, identifies, and classifies the BYTE stakeholders. A BYTE stakeholder is any group or individual who can affect or is affected by the information ecosystem in a positive or negative manner. The high-level taxonomy has 4 main stakeholder types:

- **Data Providers:** Person or organisation that provides the data to the Big Data ecosystem;
- **Data Users:** Persons or organisations that consume information from the Big Data ecosystem;
- **Enablers:** Persons or organisations that support the function of the Big Data ecosystem;
- **Secondary Stakeholders:** Persons or organisations that influence or are impacted by the Big Data ecosystem and its operations, but do not interact directly with the Big Data.

Each of these stakeholder types is applied across different sector to identify potential targets of engagement activities. The following tables provides cross tabulation of stakeholder types and sectors.

Table 3 – list of potential stakeholders for different sectors

Sector	Data Providers	Data Users	Data Enablers	Secondary Stakeholders
<i>Environment</i>	- Environmental Scientists	- Environmental Scientists - Citizens - Policy Makers	- IT Engineers - Data Engineers - Network Engineers	- Policy Makers - Data Protection - Officers
<i>Crisis Management</i>	- Citizens - First Responders - Scientists - Business Owners - Local Government	- Citizens - First Responders - Crisis Managers - Scientists - Policy Makers - Legal specialists - Economists - Business owners	- IT Engineers - Data Engineers - Network Engineers	- Policy Makers - Data Protection Officers - Community Groups
<i>Utilities</i>	- Scientists - Citizens - Business Owners - Local Government - Grid Operators - City Government	- Scientist - Citizens - Policy Makers - Consumers - Economists - Legal - Economists - Energy Consumers - Energy Producers - Traffic users - City Government	- IT Engineers - Data Engineers - Network Engineers	- Policy Makers - Data Protection Officers - Community Groups - Citizens
<i>Cultural</i>	- Cultural Scientist - Librarians - Historians	- Cultural Scientist - Librarians - Archivists	- IT Engineers - Data Engineers - Network Engineers	- Policy Makers

	- Archivists - Citizens	- Historians - Citizens - Policy Makers		
<i>Energy</i>	- Scientists - Grid Operators	- Scientists - Citizens - Policy Makers - Economists - Safety Officers - Human Resources	- IT Engineers - Data Engineers - Network Engineers	- Policy Makers - Data Protection - Regulators
<i>Health</i>	- Patients - Health Care Professionals - Medical Research Scientists - Citizens - Pharmaceutical Scientists	- Health Care Professionals - Patients - Public Health Policy Makers - Pharmaceutical Scientists	- IT Engineers - Data Engineers - Network Engineers	- Policy Makers - Regulators - Economists - Data Protection Offices - Citizens
<i>Transport</i>	- Fleet owners and operators - Equipment vendors	- Citizens - Transport Policy Makers - Fleet owners and operators - Port authorities - Community Groups - Freight owners	- IT Engineers - Data Engineers - Network Engineers	- Transport Policy Makers - Regulators - Community Groups - Economists

In general, the sector-wise stakeholders are differentiated for data providers and data users, in terms of their nature of work and interest in the BBDC. Although data enablers and secondary stakeholders are somewhat similar across sectors, their involvement in a community is driven by the sector's specificities.

4.2 STAKEHOLDER ENGAGEMENT STRATEGY

The specific strategy for stakeholder engagement focuses on maximising participation of stakeholders and Advisory Board in the BYTE project. The engagement activities are scheduled at key stages of BYTE project: foundation (M18), after the roadmap delivery (M30) and at the close of the project (M36).

The project maintains a mailing list of stakeholders within the European big data community. This mailing list has more than 900 subscribers and is constantly growing over the lifetime of BYTE project. The mailing is primarily used to communicate the status of BYTE project and future planned events, through quarterly newsletters. Additional on-demand newsletters are sent to subscribers for communicating agenda and logistic details of BYTE specific events such as workshops.

The BYTE Advisory Board serves a key role in impact strategy of the BYTE project. Periodic interaction with members of the Advisory Board enables sectors specific oversight of the BYTE vision, roadmap and implementation plan for the BBDC. For this purpose, the Advisory Board is actively engaged for participation in BYTE workshops through invited talks and panel discussions. Additionally, a conference call was organised between Advisory Board members and project partners in last quarter of 2015. The purpose of this conference call was to engage Advisory Board members in the BYTE project by reporting on the previous activities; gathering feedback on completed deliverables and impact on community; and discussing future

plans for the BYTE project. Furthermore, the board members were encouraged to participate in future workshops and facilitate further networking and stakeholder engagement within their sectors.

To discuss sector-wise externalities of big data, a virtual workshop for Advisory Board members was organised in last quarter of 2016. The workshop reported on the results of following activities of BYTE to participations:

- Case studies and focus groups in crisis informatics, culture, energy, environment, healthcare, transportation and smart cities;
- Horizontal analysis and social impacts of positive and negative externalities;
- Strategies amplifying positive and diminishing negative externalities.

The outcome of each activity was validated with the workshop participants; therefore, facilitating stakeholder engagement. A similar approach will be continued with future planned workshops of BYTE. Besides these workshops, the project partners also engage stakeholders through presentations and talks at stakeholder specific events including national, international and European conferences. In this regard, project partners are encouraged to report and disseminate their activities on the BYTE project website through blog posts.

The following table summarises the activities that are already undertaken and will continue, as part of the impact strategy of the BYTE project. Each activity is associated with the success criteria useful to assess the progress and effectiveness of the activity.

Table 4 – stakeholder engagement activities

Activity	Tools	Success Criteria
<i>Identity communication</i>	BYTE Logo	
	BYTE Website	Number of unique visitors
	Mailing List	Number of subscribers
	Digital Newsletters	Number of newsletters Newsletter opening rate
<i>Events</i>	BYTE Workshops	Number of participants
	European Conferences	Attendee participation Number of BYTE presentations/talks
	International Conferences	Attendee participation Number of BYTE presentations/talks
	Local Seminars	Attendee participation Number of BYTE presentations/talks
<i>Social Media</i>	Twitter	Twitter mentions and retweets
	Facebook	Facebook shares and likes
	Blogs	Number of blog posts
<i>Print Media</i>	Newspapers	Number of news articles

	Institutional Press	Number of institutional articles
<i>Direct Meetings</i>	Onsite Interviews	Number of interviews Sector-wise participation
	Focus groups	Number of focus groups Sector-wise participation
	Conference Calls	Advisory Board participation
	Invited Talks	Number of talks by AB and stakeholders

Another key aspect of stakeholder engagement in BYTE project is the on-going collaboration with the BDVA. To this end, BYTE project partners are directly involved in the BDVA and actively contribute towards its management and sustainability.

Thanks to this collaboration with the BDVA, the BBDC will be able to engage all the major stakeholders in the European Big Data market, including those that are not currently already present in the membership and those that are outside of the community scope, namely Industry and Producers of Big Data. All of those stakeholders will be present at the BDVA Annual Summits and will receive BBDC communications sent to BDVA members via the cooperation mechanism agreed with the BDVA, thus avoiding duplication of effort as recommended in the Year 2 Review of BYTE.⁷

4.2.1 INCENTIVE MECHANISMS

Stakeholders, most specifically NGOs, NPOs and CSOs, will be incentivised to participate in the BBDC via the link that the BBDC can offer those organisations to industry and policy-makers and via an opportunity to feed directly into the EC research programme on big data.

Through participation in the BBDC, community members will have the opportunity to liaise directly with BDVA members and participate in task force activities. The BDVA has accepted the BBDC as a contributor to the legal and social issues task force and will accept regular inputs from the BBDC to their work. Specifically, most task force activities are arranged around key discussion items, and participants have the opportunity to set those agenda items and comment directly on them. Furthermore, they will have the opportunity, through BYTE BDVA members (Trilateral, CNR, Insight, Siemens, etc.) to feed indirectly into the SRIA updates and the EC work programmes (e.g. H2020 calls). In particular, BYTE BDVA members have agreed to act as “champions” for the BBDC members, to ensure their perspectives are included within both documents.

BYTE has engaged directly with founding and prospective BBDC members to solicit their feedback on incentive mechanisms. The feedback we have received is that direct linkages to industry and opportunities to input directly into the SRIA and EC work programmes are particularly welcome for CSOs, NGOs and NPOs. We believe this constitutes a sufficient

⁷ See Second Review Report, p. 4: “We also encourage the consortium to consider positioning the project in the special area of NGOs, non-for profit organizations, government organization and citizens. So that the project may be unique and have a chance to have a real impact, avoiding duplication of efforts with other initiatives, e.g. BDVA, etc.”

incentive for participation in the BBDC. The following table summarises these and other additional incentive mechanisms that may also encourage participation in the BBDC:

Table 5 – member incentives

Category	Incentive
Easy access to relevant stakeholders	• Communication and dissemination opportunities through managed contacts of industry with minimum administrative overhead • Networking through BBDC organized workshops and targeted events • Direct contact with European industry and policy makers, providing opportunities to channel instances of interest
Early access to information	• First-hand access to information related to EU policy and working documents on big data • Industry- or sector-specific analysis and reports • BBDC Research and Policy Roadmaps and other BYTE results
Visibility	• Increased visibility on national and EU levels • Opportunity to make civil society as first-class citizen in Big Data ecosystem • Opportunity to contribute to the BDV SRIA • Opportunity to contribute to EC work programmes (e.g. H2020 calls), through BBDC members who are also part of the BDVA • Opportunity to steer the BBDC Research and Policy Roadmaps and take an active role in BBDC evolution

4.2.2 IMPACT ASSESSMENT

The impact of the BBDC is assessed and measured in terms of its membership and links with big data related networks. The BBDC was founded by 34 individual members during one of the BYTE workshops. These individuals represented academia, industry, and civil society organizations. The majority of founding members again met in a workshop organized under WP7 for further strengthen the BBDC and discuss its relationship with the BDVA. This workshop was organized in co-location with the annual summit of the BDVA. To further engage with the BBDC stakeholder, the BYTE consortium members have identified 50 networks related to big data, to contact to raise awareness of the BBDC in big data ecosystem. Furthermore, the BBDC strategy and sustainability plan was presented to the members of the BYTE Advisory Board. The board member from civil society organization showed interest in the community and provided feedback. During this consultation process, it was acknowledged that the engagement with CSOs is particularly challenging, due to their limitations in terms of funding and trust in industry and government.

All the 11 members of the BYTE consortium have joined the BBDC as Full Members (see the attached signed documents in Annex B). Among them, 5 are also members of the BDVA. At

present, the BBDC membership includes 7 other Full Members, 2 of whom are also BDVA members.

Besides, the BBDC contact list has been populated with the over 900 contacts of the BYTE mailing list. These is the subset of the whole contacts made in the course of BYTE who did not opt out, hence confirming their interest in BYTE outcomes and evolution. As such, they have been included in the BBDC as Interested Parties. This set include at least 1 member of the BDVA and over 25 CSOs. 16 other CSOs (12 individuals and 4 organisations) joined the community with a status other than Interested Party.

Table 6 – metrics and key performance indicators

BBDC metrics and KPI		Poor	Good	Excellent
BBDC founding members	34	< 10	10-20	> 20
Interested Parties	959	< 500	500-1000	> 1000
Associate Members	9	< 20	20-50	> 50
Full Members	20	< 5	5-20	> 20
Full Members + BDVA	7	< 5	5-10	> 10
Ambassadors	11	< 5	5-10	> 10
Members with social/legal perspective (e.g. CSOs, social scientists)	41	< 10	10-50	> 50
Links to related networks (e.g. EU projects, Big Data related organizations)	50	< 10	10-20	> 20
Number of Big Data community members	988	< 500	500-1000	> 1000

As shown in Table 6, the metrics of the BBDC mostly rank good, towards excellent, in terms of key performance indicators. The only exception is the number of Associate Members, which should ideally be higher to better balance the various member categories. The membership of the BBDC is currently being restructured along the categories introduced by D7.1.2, increasing the number of Full, Associate Members and Ambassadors and, hence, the stakeholder engagement in the community.

5. EVOLUTION OF THE BIG DATA COMMUNITY

This chapter elaborates on the possible measures to accommodate and control the evolution of the BBDC, so as to ensure its continued efficiency and effectiveness.

Given the fast pace of societal evolution, legal frameworks and economical and technological landscape, it is essential that the governance of the BBDC incorporates means for adapting and adjusting to mutable conditions, so as to remain current and efficient, a concept known as “evolvability”.

The following sections consider how to evolve the strategy and charter, and the development plan of the BBDC, to accommodate the possible needs arising in the future years, until 2020.

5.1 STRATEGY AND CHARTER EVOLUTION

Tracking the progress of the roadmap implementation will allow assessing the impact of the BBDC and revisiting the BYTE vision, should the European big data ecosystem change in an unanticipated way. Likewise, also the strategy and charter of the BBDC needs to stay current and efficient.

As elaborated in D7.1.2, the chosen strategy is that the BBDC channel its contribution through the BDVA, into which it may eventually merge, around or after 2020. However, also the other options considered (Stand-alone and Federal) present significant strengths and opportunities that will be re-evaluated in the coming months and years. Hence, we will continue exploring the three options moving forward. Besides, we will continue scoping possible additional funding opportunities, also in relationship to the overall evolution of the BBDC strategy.

The evolvability of the BBDC strategy is implemented as follows:

1. Develop the three identified strategies for the BBDC, in terms of their charter/mission, timing, roadmap development and possible funding;
2. Process the alternatives and build consensus for the chosen BBDC approach (note that it could consist of functions, capabilities and resources from all three strategic alternatives);
3. Present the resulting BBDC strategy to the stakeholders and get their consensus and feed-back;
4. Describe the new BBDC organization in concrete and practical ways (detail staff requirement, cost budget, financing and funding, initial seed funding, set up a proper business plan, create marketing material, service descriptions, etc.)

As a first task of the community building exercise, we have presented the three options to identified AB members and/or BBDC founding members and begun to get consensus and feedback around the chosen Join & Merge hypothesis. In the future, the BBDC may be constituted as a formal association, or a similar suitable legal entity, so that we could fall back to the Stand-alone or the Federal option, in case the Join & Merge option become impractical, or undesirable.

The next chapter elaborates on the charter evolution for the Join & Merge option. The following two chapters exemplify possible evolution scenarios of the BBDC, respectively towards an autonomous community and an umbrella organization.

5.1.1 JOIN & MERGE OPTION

In terms of the BBDC governance structure, the chosen Join & Merge strategy implies to align with the appropriate elements of the BDVA governance structure, i.e. a task force with a quite flat hierarchy. This is a flexible arrangement that allows to further structure the BBDC (e.g., president, secretariat, advisory council), should it be required by its evolution, namely in case the overall strategy is changed to the Stand-alone or to the Federal option, as elaborated in chapter 3.

To further structure the BBDC membership, possible additional membership categories may be introduced, such as:

- Advisors – individuals selected due to seniority within their organisation and regarded as a significant influential and insightful source;
- Sponsors – members that contribute economically to the BBDC (e.g. shareholders).

Besides, additional BBDC membership categories may be conceived for specific stakeholder types, such as civil society organisations and NGOs, which may be reluctant to engage with an industrial organisation, for political or financial reasons (e.g. “lightweight” member, observers).

As a possible evolution of its activities, the BBDC may gather and organise intelligence on planned, on-going and finished big data projects and activities, current big data issues that needs to be addressed, big data services and products that can be offered to the public and finding opportunities for collaboration, learning and innovation. This could lead to opportunities for sustaining the BBDC, such as:

- A professional contracting function to initiate a big data related project application, bringing together consortium partners, linking with similar projects and organisations, facilitating the application, negotiating terms and providing advice for the execution lifecycle. BBDC contracting can work with any type of frame contracting used by the EU Commission, Institutions, Agencies, Projects, EU member countries, organisations and universities, institutes, companies and organisations;
- A consulting function to scrutinise candidate big data project application, so as to advise on possible redundant and/or outdated research topics, which would lower the probability of success;
- An expertise provisioning function, to mitigate negative consequences of societal externalities. Potential customers may include governments implementing open data policies at both the national, state, and city level, for users to develop new applications that can generate public good.

5.1.2 STAND-ALONE OPTION

The mission for the BBDC in the stand-alone scenario is based on the concept of a service provider that analyses and solves issues related to big data and societal externalities. This is a specialist community that is building knowledge and packages it into marketable services and products.

In this case, the BBDC should evolve into a for-profit association, with a charter clearly stating business objectives, transparency, openness, security, finances, budgets and profits and the intention to reinvest profits in the research and development of services. The BBDC charter should clearly state that the organization is engaged in building and delivering trust for its customers.

The BBDC charter should address how the BBDC will attract, develop and manage skilful people capable of delivering technical, managerial, advisory, legal, security, and political services. These people will become unique experts, grasping social externalities and big data and its impact on all levels of society and in all regions.

The BBDC charter should also allow for attracting people and organizations into a global network with a common interest in handling societal externalities. The network should be led and managed by the BBDC. The BBDC charter should also include how to invite potential customers into the network, perhaps organizing them into an advisory council.

5.1.3 FEDERAL OPTION

The mission for the BBDC in the umbrella organization scenario is based on the concept of a facilitator and organizer, connecting skilled people and organizations together, so they can provide solutions for issues related to big data and societal externalities. This is a federated community identifying and binding resources together.

In this case, the BBDC should evolve into a for-profit foundation, with a charter clearly stating business objectives, transparency, openness, security, finances, budgets and profits.

The BBDC charter should also clearly state that the organization is engaged in building and delivering trust for its customers, and based on the fact that BBDC is chartered as a foundation makes it possible to act as a neutral and independent third party.

The BBDC charter should address how the BBDC will attract skilful people and organizations into a joint network capable of delivering technical, managerial, advisory, legal, security, and political services. The BBDC charter would not necessarily recommend the BBDC to lead and operate projects and activities, instead put more focus on facilitating the possibility for activities to happen. The charter will therefore be limited in terms of responsibility and potential liability.

The BBDC charter should describe the stipend-based, objective and independent advisory roles to support EU's Agencies, Institutions, Commission and Parliament, and National Governments. The role could be thought of as an Ombudsman or Accountant, appointed to ensure that public authorities develop, implements and complies with laws and other statutes for big data and its societal externalities.

The BBDC charter should also describe the role to arrange signature conferences and seminars, and the importance to bring users, customers, providers and researchers together. Collaboration and communication are key capabilities.

5.2 DEVELOPMENT PLAN EVOLUTION

The interim development plan for the BBDC is outlined in D7.1.2, chapter 5. It consists of three phases:

- Preparation – identifying the founding members, finalizing the charter and leading to the foundation of the community;
- Consolidation – engaging the parties who have been already involved in BYTE workshops and activities;
- Expansion – reaching out to the rest of the BYTE contacts, which have not been engaged so far.

It indicates appropriate milestones at the end of each phase, for assessing and measuring its implementation, and possibly apply the necessary corrections.

We consider this structuring of the development plan to be quite robust, so as to accommodate the possible evolutions of the BBDC. Additional phases may be conceived, if need be. For example, should the BBDC evolve to require substantial financial resources, a possible future evolution of the development plan is to include a consultation phase, to assess what financial contributions to expect and from who.

The next chapter elaborates on the development plan for the Join & Merge option. In case this option becomes impractical, or undesirable, the development plan will be adapted to one of the alternative strategies. The following two chapters exemplify possible evolution scenarios of the BBDC, respectively towards an autonomous community and an umbrella organization.

5.2.1 JOIN & MERGE OPTION

The development plan of the chosen Join & Merge option is also dependent on the development of the target organization (i.e. the BDVA). The major benefit will be a flying start and exploiting an established contact network. As observed above, under this perspective, it may be foreseeable (or even desirable, as an indication of full success), that the BBDC eventually merge into the chosen initiative. In the medium to long term, the development plan of the Join & Merge option could include the following steps:

1. Preparation work for the foundation of the BBDC, decide upon the specialist vs. the facilitator type of community or a mix of both. Describe the current (and planned) network, dissemination, communication, organization, resources (staff and funding) and specialties;
2. Create an association, BBDC, consisting of the founding members of BYTE, transfer all BYTE intellectual property rights over to BBDC, so it can carry out negotiations with the target organization;

3. Negotiation topics:

- a. Agreed current state;
 - b. Agreed final objective;
 - c. What can BBDC contribute with?
 - d. What can the target organization contribute with?
 - e. New or improved funding opportunities;
 - f. Positive impact on the big data market;
 - g. Key staff resources, link to key customers;
 - h. Joint charter and mission statement;
 - i. Merging practicalities, such as leadership, staffing, renegotiating frame-contracts and agreements, locations and facilities;
 - j. Joint communication and information;
4. Upon success of negotiations, merge BBDC and the target organization;
 5. Move BBDC projects and activities to the new merged organization;
 6. Communicate the successful merger to all stakeholders, internally and externally.

5.2.2 STAND-ALONE OPTION

The stand-alone scenario is based on the concept of a specialist community that is building knowledge and packages it into marketable services and products. The purpose of the BBDC in this scenario is to evolve societal externality services, network with like-minded people and organizations and offer services and expertise to customers with big data issues.

The development plan could include the following steps:

1. Preparation work for the foundation of the BBDC, decide upon the specialist vs. the facilitator type of community or a mix of both. Describe the current (and planned) network, dissemination, communication, organization, resources (staff and funding) and specialties;
2. Create an association, BBDC, consisting of the founding members of BYTE, transfer all BYTE intellectual property rights over to BBDC, so it can use that knowledge to create needed services and funding opportunities;
3. Initiate the first Societal Externalities projects, helping customers with their big data issues;
4. Market and communicate the results from the projects. Begin building a contact network of customers and specialists;
5. Compete with other communities on upcoming projects;
6. Engage in seminars, conferences, training, investigations, continue building contact and advisory networks. Use key people with extensive networks;
7. Participate in EU development project, to generate revenues.

5.2.3 FEDERAL OPTION

The umbrella organization scenario is based on the assumption that there is sufficient need from EU and national governments, industries, academia and communities to collaborate on big data societal externalities.

The development plan could include the following steps:

1. Preparation work for the foundation of the BBDC, decide upon the specialist vs. the facilitator type of community or a mix of both. Describe the current (and planned) network, dissemination, communication, organization, resources (staff and funding) and specialties;
2. Create an association, BBDC, consisting of the founding members of BYTE, transfer all BYTE intellectual property rights over to BBDC, so it can use that knowledge to create needed activities, services and funding opportunities;
3. Create the BBDC network, through personal contacts. From that network identify the most urgent networking topics to correctly address big data societal externalities. Setup and facilitate activities, seminars, conferences, investigations around these topics:
 - a. Big data risk analysis, big security;
 - b. Big data legal issues, integrity, IPR and copyrights;
 - c. Big data political;
 - d. Big data societal and ethics;
 - e. Big data economics;
 - f. Big data technological (integration and analytics);
4. Offer customers to setup “permanent” advisory functions to address societal externalities in terms of development, implementation and enforcement of rules, regulations, laws and standards;
5. Continue evolving the community and mission.

6. FUTURE ACTIONS AND TIMELINE

As per the BYTE DoW, in addition to ensuring that the project website remains in place for at least a year after the completion of the project, the consortium will also ensure that the BBDC remains active at least until 2020. Since BYTE ended in February 2017, the BBDC should plan its activities within a horizon of at least 3 years, starting in March 2017. We consider such expected time of operation adequate, for the BBDC to accomplish its mission.

This chapter identifies future action items for the BBDC in the coming years, with expected results and actors that will deliver them, associated timelines, risk assessments and contingency plans. Each action item is targeted at one of the BBDC objectives, as indicated by numbering:

1. Engage NGOs, NPOs, CSOs, third sector, local governments, tech-transfer organizations;
2. Continue BYTE research on societal externalities of big data, and how to make the best of them;
3. Input and feedback to EC, Member States, BDVA, membership and related networks.

The actors responsible for delivering the expected results are identified in terms of functions of the BBDC Governance, whose respective roles are currently assigned ad-interim to BYTE consortium members, as follows:

- Coordination and general organisation
 - CNR - Lorenzo Bigagli (Deputy: DNV GL - Jarl Magnusson)
- Impact and engagement
 - INSIGHT - Ed Curry (Deputy: INSIGHT - Umair ul Hassan)
- Communication
 - UIBK - Anna Fensel (Deputy: KIFÜ - Csilla Godri)
- Liaisons
 - TRI - Rachel Finn

These governance functions and the respective role assignment may evolve in the future, according to the evolution of the BBDC. The following Table 7 identifies the main lines of activity for the BBDC in the span of its full time of operation, with associated timelines, expected outcomes and responsibilities. This planning may obviously evolve, according to the future decisions made by the BBDC governance and membership. In particular, the final merging of the BBDC into the BDVA will be defined in the future, depending on the co-evolution of the European big data stakeholders.

Table 7 – action items, timing, expected outcomes and responsibilities

Action Item	Timeline	Expected results	Delivered by
1.1 BBDC membership expansion	Ongoing	- contacts with relevant third sector actors - new members	Impact and engagement, Communication
3.1 Liaisons and outreach	Ongoing	- contacts with relevant big data related networks - new liaisons	Liaisons, Communication

		- input BYTE/BBDC findings and guidelines - input and validation of BDVA SRIA - input into EC work programme	
1.2 BBDC membership restructuring	Mar-Dec 2017	- balanced presence of different types of members (Full, Associate, etc.) - ambassador network	Communication
2.1 BBDC Focus Areas 2017	Aug-Dec 2017	- research and/or consultation on current big data issues, good practice and touch points with standards and methodologies on Energy, Transport, Trusted AI in Smart Industry	Coordination and general organisation
3.2 BBDC Workshop 2017	21-23 Nov 2017	- workshop co-located with EDF/BDVA Summit 2017 - report on Focus Areas 2017	Coordination and general organisation, Liaisons
1.3 BBDC governance renewal 2018	Nov-Dec 2017	- renewal of BBDC governance for 2018	Coordination and general organisation
2.2 BBDC Focus Areas 2018	Jan-Dec 2018	- selection of 3 areas - research and/or consultation on current big data issues, good practice and touch points with standards and methodologies	Coordination and general organisation
2.3 BBDC complete transition from BYTE	Mar 2018	- full handover from BYTE website to BBDC	Communication
3.3 BBDC Workshop 2018	TBD	- workshop co-located with BDVA Summit 2018 - report on Focus Areas 2018	Coordination and general organisation, Liaisons
1.4 BBDC governance renewal 2019	Nov-Dec 2018	- renewal of BBDC governance for 2019	Coordination and general organisation
2.4 BBDC Focus Areas 2019	Jan-Dec 2019	- selection of 3 areas - research and/or consultation on current big data issues, good practice and touch points with	Coordination and general organisation

		standards and methodologies	
3.4 BBDC Workshop 2019	TBD	- workshop co-located with BDVA Summit 2019 - report on Focus Areas 2019	Coordination and general organisation, Liaisons
1.5 BBDC governance renewal 2020	Nov-Dec 2019	- renewal of BBDC governance for 2020	Coordination and general organisation
3.5 BBDC merging into BDVA	Jan-Mar 2020	TBD	Liaisons

The following Table 8 outlines a contingency plan for each line of activities, should its expected results not be achieved.

Table 8 – action items, risks and contingency plans

Action Item	Risk assessment	Contingency plan
1.1 BBDC membership expansion	Contacts with third sector actors may be insufficient to attract relevant new members	Leverage the ambassador network to directly engage prospective stakeholders, e.g. participating in their meetings
3.1 Liaisons and outreach	Outreach may be scarcely effective	Directly engage with prospective stakeholders, e.g. participating in their meetings; solicit the BBDC members who are also members of the BDVA to channel specific contributions on the SRIA; allocate resources committed by Full Members to take part in EC consultation activities
1.2 BBDC membership restructuring	Not enough members may qualify as Full, Associate, Ambassador, etc.	Select individual interested parties and identify specific value propositions to engage them directly
2.1 BBDC Focus Areas 2017	Research and/or consultation work may be insufficient	Allocate resources committed by Full Members to improve the results
3.2 BBDC Workshop 2017	BDVA may not be able to host the workshop within the Summit	Find another suitable venue (e.g. EDF, RDA, EC meeting)
1.3 BBDC governance renewal 2018	No new candidates for BBDC governance roles	Identify candidates among BYTE consortium members, who committed to support the BBDC until 2020

2.2 BBDC Focus Areas 2018	Research and/or consultation work may be insufficient	Allocate resources committed by Full Members to improve the results
2.3 BBDC complete transition from BYTE	No significant risk is foreseen for this activity	
3.3 BBDC Workshop 2018	BDVA may not be able to host the workshop within the Summit	Find another suitable venue (e.g. EDF, RDA, EC meeting)
1.4 BBDC governance renewal 2019	No new candidates for BBDC governance roles	Identify candidates among BYTE consortium members, who committed to support the BBDC until 2020
2.4 BBDC Focus Areas 2019	Research and/or consultation work may be insufficient	Allocate resources committed by Full Members to improve the results
3.4 BBDC Workshop 2019	BDVA may not be able to host the workshop within the Summit	Find another suitable venue (e.g. EDF, RDA, EC meeting)
1.5 BBDC governance renewal 2020	No new candidates for BBDC governance roles	Identify candidates among BYTE consortium members, who committed to support the BBDC until 2020
3.5 BBDC merging into BDVA	BDVA may not be the most relevant actor in the EU strategy on big data	Explore possible alternatives (given the commitment of the EC on the Big Data cPPP, this risk is considered negligible before 2020)

ANNEX A – LETTER OF INTENT BY FULL MEMBERS (TEMPLATE)

Template letter of intent expressing commitment by Full Members to sustain the BBDC operations until 2020.

Dear coordinator of the BBDC,

The BYTE project was funded by the European Commission to assist European science and industry in capturing the positive impacts and diminishing the negative impacts of big data collection and processing.

BYTE has delivered a research and policy roadmap to help Europe capture a greater share of the big data market by using big data responsibly.

BYTE has launched the BYTE Big Data Community (BBDC), a sustainable, cross-disciplinary platform that will implement the BYTE roadmap and assist Europe's large population of big data stakeholders in identifying and meeting big data challenges.

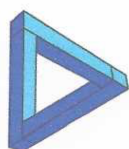
We hereby submit this letter of intent to support and commit ourselves to sustain the BBDC until 2020, providing the following in-kind contributions:⁸

- 120 hours/year (0,75PM), dedicated to the management and operation of the BBDC (included 1-hour monthly teleconference) and consultation/research work on selected topics of interest;*
- participation of 1 person in a meeting in the EU, e.g. annual BBDC workshop, annual Big Data Value Association (BDVA) Summit, or equivalent meeting relevant to the BBDC objectives (agreed with BBDC management).*

As a Full Member, we do expect to receive:

- First-hand information on the implementation of Big Data Societal Externalities, which might have an impact on current technology, standards, legal, politics, security, ethical and economic pre-requisites.*
- Visibility, as one of the leading organizations behind BBDC. Opportunity to market products and services.*
- Invitations to participate or offer proposals for projects and activities.*
- Invitations to participate in high-level EU-meetings and other significant meetings.*

⁸ Members anticipating being unable or unwilling to provide such voluntary, in-kind effort, for a given year, may allocate equivalent financial support. Such budget will be used to compensate the partners actually providing for the corresponding additional effort.

ANNEX B – LETTERS OF INTENT BY BYTE PARTNERS**Trilateral Research Ltd**www.trilateralresearch.com

Dear coordinator of the BBDC,

We hereby submit this letter of intent to fulfil our obligations as a consortium member of the EU Project BYTE. The BYTE project was funded by the European Commission to assist European science and industry in capturing the positive impacts and diminishing the negative impacts of big data collection and processing.

BYTE has delivered a research and policy roadmap to help Europe capture a greater share of the big data market by using big data responsibly. BYTE has launched the BYTE Big Data Community (BBDC), a sustainable, cross-disciplinary platform that will implement the BYTE roadmap and assist Europe's large population of big data stakeholders in identifying and meeting big data challenges.

As BYTE consortium members, we do support and commit ourselves to sustain the BYTE Big Data Community (BBDC) until 2020, providing the following in-kind contributions:

- 120 hours/year (0,75PM), dedicated to the management and operation of the BBDC (included 1-hour monthly teleconference) and consultation/research work on selected topics of interest;
- participation of 1 person in a meeting in the EU, e.g. annual BBDC workshop, annual Big Data Value Association (BDVA) Summit, or equivalent meeting relevant to the BBDC objectives (agreed with BBDC management).

As a Full Member, I do expect to receive:

- First-hand information on the implementation of Big Data Societal Externalities, which might have an impact on current technology, standards, legal, politics, security, ethical and economic pre-requisites.
- Visibility, as one of the leading organizations behind BBDC. Opportunity to market products and services.
- Invitations to participate or offer proposals for projects and activities. Invitations to participate in high-level EU-meetings and other significant meetings.

Sincerely,

MR KUSH WADHWA
DIRECTOR
TRILATERAL RESEARCH, LTD.

Registered in England and Wales

Trilateral Research Ltd no. 8698690

Registered office: 72 Hammersmith Road, Crown House, London W148TH UK



CNR - National Research Council of Italy
Institute of Atmospheric Pollution Research
<http://www.iaa.cnr.it>

Dear coordinator of the BYTE Big Data Community,

We hereby submit this letter of intent to fulfil our obligations as a consortium member of the EU Project BYTE (Grant Agreement no. 619551). The BYTE project was funded by the European Commission to assist European science and industry in capturing the positive impacts and diminishing the negative impacts of big data collection and processing.

BYTE has delivered a research and policy roadmap to help Europe capture a greater share of the big data market by using big data responsibly. BYTE has launched the BYTE Big Data Community (BBDC), a sustainable, cross-disciplinary platform that will implement the BYTE roadmap and assist Europe's large population of big data stakeholders in identifying and meeting big data challenges.

As BYTE consortium members, we do support and commit ourselves to sustain the BBDC until 2020, providing the following in-kind contributions:

- 0,75 Person-Month dedicated to the management and operation of the BBDC (included 1-hour monthly teleconferences) and consultation/research work on selected topics of interest;
- Participation of 1 person in a meeting in the EU, e.g. annual BBDC workshop, annual Big Data Value Association (BDVA) Summit, or equivalent meeting relevant to the BBDC objectives (agreed with BBDC management).

As a Full Member, I do expect to receive:

- First-hand information on the analysis of big data societal externalities, which might have an impact on current technology, standards, legal, politics, security, ethical and economic pre-requisites;
- Visibility, as one of the leading organizations behind the BBDC;
- Opportunity to market products and services;
- Invitations to participate or offer proposals for projects and activities;
- Invitations to participate in high-level EU-meetings and other significant meetings.

THE DIRECTOR
Dr. Nicola Pirrone



04.05.2017

Letter of Intent for BYTE Big Data Community (BBDC)

The BYTE project was funded by the European Commission to assist European science and industry in capturing the positive impacts and diminishing the negative impacts of big data collection and processing. The project has delivered a research and policy roadmap to help Europe capture a greater share of the big data market by using big data responsibly.

BYTE has launched the BYTE Big Data Community (BBDC), a sustainable, cross-disciplinary platform that will implement the BYTE roadmap and assist Europe's large population of big data stakeholders in identifying and meeting big data challenges.

We hereby submit this letter of intent to support and commit ourselves to sustain the BBDC until 2020, providing the following in-kind contributions:

- 120 hours/year (0,75PM), dedicated to the management and operation of the BBDC (included 1-hour monthly teleconference) and consultation/research work on selected topics of interest.
- Participation of 1 person in a meeting in the EU, such as the annual BBDC workshop, annual Big Data Value Association (BDVA) Summit, or equivalent meetings relevant to the BBDC objectives (agreed with BBDC management).

As a Full Member, we do expect to receive:

- First-hand information on the implementation of Big Data Societal Externalities, which might have an impact on current technology, standards, legal, politics, security, ethical and economic pre-requisites.
- Visibility, as one of the leading organizations behind BBDC.
- Invitations to participate in or offer proposals for projects and activities.

Yours Sincerely,

David Cameron
Centre Coordinator



Dear coordinator of the BBDC,

We hereby submit this letter of intent to fulfil our obligations as a consortium member of the EU Project BYTE. The BYTE project was funded by the European Commission to assist European science and industry in capturing the positive impacts and diminishing the negative impacts of big data collection and processing.

BYTE has delivered a research and policy roadmap to help Europe capture a greater share of the big data market by using big data responsibly. BYTE has launched the BYTE Big Data Community (BBDC), a sustainable, cross-disciplinary platform that will implement the BYTE roadmap and assist Europe's large population of big data stakeholders in identifying and meeting big data challenges.

As BYTE consortium members, we do support and commit ourselves to sustain the BYTE Big Data Community (BBDC) until 2020, providing the following in-kind contributions:

- 120 hours/year (0,75PM), dedicated to the management and operation of the BBDC (included 1-hour monthly teleconference) and consultation/research work on selected topics of interest;
- participation of 1 person in a meeting in the EU, e.g. annual BBDC workshop, annual Big Data Value Association (BDVA) Summit, or equivalent meeting relevant to the BBDC objectives (agreed with BBDC management).

As a Full Member, I do expect to receive:

- First-hand information on the implementation of Big Data Societal Externalities, which might have an impact on current technology, standards, legal, politics, security, ethical and economic pre-requisites.
- Visibility, as one of the leading organizations behind BBDC. Opportunity to market products and services.
- Invitations to participate or offer proposals for projects and activities.
- Invitations to participate in high-level EU-meetings and other significant meetings.

Yours sincerely

A handwritten signature in black ink that reads "Scott Cunningham".

Scott Cunningham
Associate Professor
Faculty of Technology Policy and Management
Delft University of Technology



Vrije Universiteit Brussel

FACULTY OF LAW AND CRIMINOLOGY
Director Department of Interdisciplinary Studies of Law (Metajuridica)
Director VUB Research Group Fundamental Rights and Constitutionalism (FRC)
Member VUB Research Group on Law, Science, Technology & Society (LSTS)
Prof. Dr. Paul De Hert

Brussels, 23th January 2017

Dear coordinator of the BBDC,

The LSTS research group of the Vrije Universiteit Brussel (VUB) hereby submits this letter of intent to fulfil its obligations as a consortium member of the EU Project BYTE. The BYTE project was funded by the European Commission to assist European science and industry in capturing the positive impacts and diminishing the negative impacts of big data collection and processing.

BYTE has delivered a research and policy roadmap to help Europe capture a greater share of the big data market by using big data responsibly. BYTE has launched the BYTE Big Data Community (BBDC), a sustainable, cross-disciplinary platform that will implement the BYTE roadmap and assist Europe's large population of big data stakeholders in identifying and meeting big data challenges.

As BYTE consortium members, we do support and commit ourselves to sustain the BYTE Big Data Community (BBDC) until 2020, providing the following in-kind contributions:

- participation in consultations and discussions, in the management and operation of the BBDC (included 1-hour monthly teleconference) and in a meeting in the EU, e.g. annual BBDC workshop, annual Big Data Value Association (BDVA) Summit, or equivalent meeting relevant to the BBDC objectives (agreed with BBDC management).

As a Full Member, I do expect to receive:

- First-hand information on the implementation of Big Data Societal Externalities, which might have an impact on current technology, standards, legal, politics, security, ethical and economic pre-requisites.
- Visibility, as one of the leading organizations behind BBDC. Opportunity to market products and services.
- Invitations to participate or offer proposals for projects and activities.
- Invitations to participate in high-level EU-meetings and other significant meetings.

Best regards,

Paul De Hert

Room 4B 317 - Pleinlaan 2 - 1050 Brussel - Belgium Tel. +32 (0)2 629 26 42 - Fax +32 (0)2 629 22 89 serge.gutwirth@vub.ac.be - www.vub.ac.be/LSTS

DEPARTMENT
INTERDISCIPLINARY
LEGAL STUDIES
(DILS-JURI)
VRIJE UNIVERSITEIT BRUSSEL

LSTS
LAW, SCIENCE,
TECHNOLOGY &
SOCIETY STUDIES
Vrije Universiteit Brussel
BRUSSEL

FRC
FUNDAMENTAL RIGHTS
& CONSTITUTIONALISM
RESEARCH GROUP
Vrije Universiteit Brussel



Kormányzati Informatikai Fejlesztési Ügynökség



Nemzeti Információs Infrastruktúra Fejlesztési Program

Reference: N...³⁹.../2017

Budapest, 31.01.2017

Dear coordinator of the BBDC,

We hereby submit this letter of intent to fulfil our obligations as a consortium member of the EU Project BYTE (Grant Agreement No. 619551). The BYTE project was funded by the European Commission to assist European science and industry in capturing the positive impacts and diminishing the negative impacts of big data collection and processing.

BYTE has delivered a research and policy roadmap to help Europe capture a greater share of the big data market by using big data responsibly. BYTE has launched the BYTE Big Data Community (BBDC), a sustainable, cross-disciplinary platform that will implement the BYTE roadmap and assist Europe's large population of big data stakeholders in identifying and meeting big data challenges.

As BYTE consortium members, we do support and commit ourselves to sustain the BYTE Big Data Community (BBDC) until 2020, providing the following in-kind contributions:

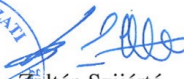
- participation in consultations, discussions and coordination activities of the BBDC (included 1-hour monthly teleconference)
- participation of our representative at the annual key meeting of the BBDC

As a BBDC member organisation, we do expect:

- first-hand information on big data results, developments, future trends etc.;
- invitations to participate or offer proposals for projects and activities;
- Invitations to participate on significant meetings.

Wishing a successful operation to the BBDC,

Sincerely,


Zoltán Szijártó
Executive President

Centre for
Data Analytics



27 January 2017

NUI Galway
University Road
Galway, Ireland

T +353 91 495 053
F +353 91 495 541

info@insight-centre.org
www.insight-centre.org

Dear coordinator of the BBDC,

We hereby submit this letter of intent to fulfil our obligations as a consortium member of the EU Project BYTE. The BYTE project was funded by the European Commission to assist European science and industry in capturing the positive impacts and diminishing the negative impacts of big data collection and processing.

BYTE has delivered a research and policy roadmap to help Europe capture a greater share of the big data market by using big data responsibly. BYTE has launched the BYTE Big Data Community (BBDC), a sustainable, cross-disciplinary platform that will implement the BYTE roadmap and assist Europe's large population of big data stakeholders in identifying and meeting big data challenges.

As BYTE consortium member and BDVA founding member, we agree to support the BBDC until 2020, by providing the following in-kind contributions:

- Participation in consultations and discussions for management and coordination activities of the BBDC
- Participation in an annual meeting or event organized by the BBDC that is relevant to its objectives

If you require any additional information, please do not hesitate to contact me on +353 91 492973 or email edward.curry@insight-centre.org.

Yours sincerely,



Dr. Edward Curry,
Research Leader in Big Data,
Insight Centre for Data Analytics,
National University of Ireland, Galway.





National Research Council of Italy
Institute of Atmospheric Pollution
Research (CNR-IIA)
Via Madonna del Piano 10
50019 Sesto Fiorentino
ITALIA

Contact: Fanny Rossetti
Tel: +334 7661 5568
Email: Fanny.rossetti@inria.fr

Our ref: SAF/FR/170125

**Subject: EU Project BYTE
BYTE Big Data Community**

Montbonnot, 25 January 2017

Dear coordinator of the BBDC,

We hereby submit this letter of intent as a consortium member of the EU Project BYTE. The BYTE project was funded by the European Commission to assist European science and industry in capturing the positive impacts and diminishing the negative impacts of big data collection and processing.

BYTE has delivered a research and policy roadmap to help Europe capture a greater share of the big data market by using big data responsibly. BYTE has launched the BYTE Big Data Community (BBDC), to foster a cross-disciplinary approach towards the implementation of the BYTE roadmap and assist Europe's large population of big data stakeholders in identifying and meeting big data challenges.

In our role as BYTE consortium member and BDVA member, we aim to support the BYTE Big Data Community (BBDC) until 2020 by leveraging synergies between both communities as much as possible. This might include related coordination meeting as well as the participation in annual workshops and events, such as annual BBDC workshop, the annual Big Data Value Association (BDVA) Summit, or equivalent meeting relevant to the BBDC objectives.

Patrick GROS

Director of Inria Grenoble Rhône-Alpes

RESEARCH CENTRE
GRENOBLE - RHÔNE-ALPES
Inovallée
655 avenue de l'Europe Montbonnot



STI - Innsbruck | Technikerstraße 21a | 6020 Innsbruck, Austria

31.01.2017

Dear coordinator of the BBDC,

We hereby submit this letter of intent to fulfil our obligation as a consortium member of the EU Project BYTE. BYTE has delivered a research and policy roadmap aiming to help Europe capture a greater share of the big data market by using big data responsible. As consortium member and BBDC funding member, we agree to support the BBDC until 2020 helping BBDC to become a sustainable platform that will further implement the BYTE roadmap. We plan to provide the following in-kind contributions:

- Participation in annual meetings and further events organized by BBDC and
- Contribution to consultations and discussions for activities of BBDC.

Yours sincerely,

A handwritten signature in blue ink, appearing to read "Dieter Fensel".

Univ.-Prof. Dr. Dieter Fensel

The logo consists of three horizontal bars in light blue, dark blue, and green, followed by the text "DNV·GL" in a bold, sans-serif font.

DNV GL
Oil & Gas Norway
Veritasveien 1
N-1322 Høvik
Tel: +47 67579900
NO 945748931

Date:
31.1.2017

Our reference:
Petter Myrvang

Your reference:

Letter of Intent

Dear coordinator of the BBDC,

We hereby submit this letter of intent to fulfil our obligations as a consortium member of the EU Project BYTE. The BYTE project was funded by the European Commission to assist European science and industry in capturing the positive impacts and diminishing the negative impacts of big data collection and processing.

BYTE has delivered a research and policy roadmap to help Europe capture a greater share of the big data market by using big data responsibly. BYTE has launched the BYTE Big Data Community (BBDC), a sustainable, cross-disciplinary platform that will implement the BYTE roadmap and assist Europe's large population of big data stakeholders in identifying and meeting big data challenges.

As a BYTE consortium member, DNVGL will aim to support the BYTE Big Data Community (BBDC) until 2020 through being part of the BBDC network. Networking might include the participation in the annual BBDC workshop, other events, and coordination meetings.

Sincerely
for DNV GL

A handwritten signature in blue ink, appearing to read "Petter Myrvang".

Petter Myrvang
Head of Section
Enterprise & Information Risk Mgt

Mobile: +47 911 28 388
Petter.Myrvang@dnvgl.com

SIEMENS

Siemens AG, CT RDA BAM, Otto-Hahn-Ring 6, 81739 München

Name	Dr. Steffen Lamparter
Abteilung	CT RDA BAM SMR-DE
Telefon	+49 89 636-633788
Mobil	+49 172 5466994
E-Mail	steffen.lamparter@siemens.com
Datum	02. February 2017

Dear coordinator of the BBDC,

We hereby submit this letter of intent to fulfil our obligations as a consortium member of the EU Project BYTE. The BYTE project was funded by the European Commission to assist European science and industry in capturing the positive impacts and diminishing the negative impacts of big data collection and processing.

BYTE has delivered a research and policy roadmap to help Europe capture a greater share of the big data market by using big data responsibly. BYTE has launched the BYTE Big Data Community (BBDC), a sustainable, cross-disciplinary platform that will implement the BYTE roadmap and assist Europe's large population of big data stakeholders in identifying and meeting big data challenges.

In our role as BYTE consortium member and BDVA founding member and Vice president, we aim to support the BYTE Big Data Community (BBDC) until 2020 by leveraging synergies between both communities as much as possible. This might include related coordination meeting as well as the participation in annual workshops and events, such as annual BBDC workshop, the annual Big Data Value Association (BDVA) Summit, or equivalent meeting relevant to the BBDC objectives.

With best regards

Siemens Aktiengesellschaft

Dr. Steffen Lamparter

i.v. Ganai
Claudia Ganai

i.v. J. H. G.

Siemens AG
Research in Digitalization and Automation
Leitung: Norbert Gaus

Otto-Hahn-Ring 6
81739 München
Deutschland

Tel.: +49 (89) 636 00

Siemens Aktiengesellschaft: Vorsitzender des Aufsichtsrats: Gerhard Cromme; Vorstand: Joe Kaeser, Vorsitzender; Roland Busch, Lisa Davis, Klaus Helmrich, Janina Kugel, Siegfried Russwurm, Ralf P. Thomas
Sitz der Gesellschaft: Berlin und München, Deutschland; Registergericht: Berlin Charlottenburg, HRB 12300, München, HRB 6684
WEEE-Reg.-Nr. DE 23691322

SCF 02/2015 V13.06

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