D2.13: Online Impact Monitor

**Workpackage:** WP2 – IMPACT. Framing the European Data Economy to maximize impact

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**Abstract:** This deliverable reports about the setup of the Online Impact Monitor, that – based on the data from the Monitoring Report – is supporting the promotion of the results of the BDV PPP by visualising the highlights and showing the impact of the BDV PPP that can be presented to the different stakeholders.
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### Definitions, Acronyms and Abbreviations

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Title</th>
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<tbody>
<tr>
<td>ABC</td>
<td>Acceleration Business City</td>
</tr>
<tr>
<td>BDVA</td>
<td>Big Data Value Association</td>
</tr>
<tr>
<td>BDVe</td>
<td>Big Data Value eCosystem project</td>
</tr>
<tr>
<td>BDV PPP</td>
<td>Big Data Value Public-Private Partnership</td>
</tr>
<tr>
<td>BI</td>
<td>Business Intelligence</td>
</tr>
<tr>
<td>CMS</td>
<td>Content Management System</td>
</tr>
<tr>
<td>cPPP</td>
<td>Contractual Public-Private Partnership</td>
</tr>
<tr>
<td>EC</td>
<td>European Commission</td>
</tr>
<tr>
<td>KPI</td>
<td>Key Performance Indicator</td>
</tr>
<tr>
<td>MR</td>
<td>Monitoring Report</td>
</tr>
<tr>
<td>OIM</td>
<td>Online Impact Monitor</td>
</tr>
<tr>
<td>R&amp;D</td>
<td>Research and Development</td>
</tr>
<tr>
<td>SME</td>
<td>Small and medium-sized enterprise</td>
</tr>
<tr>
<td>SRIA</td>
<td>Strategic Research and Innovation Agenda</td>
</tr>
</tbody>
</table>

Table 1 - Definitions, Acronyms and Abbreviations
Executive Summary

The present document provides an overview of the scope and the outline of the Online Impact Monitor. This instrument has been created to support BDVA in the visualization of the data collected for the yearly Monitoring Report as well as to make the main results visually attractive for the different stakeholders promoting the impact and the results achieved by the BDV PPP.

Different categories of approaches and tools have been analysed and reflected to understand both, the opportunities and constraints. This to enable us to take a decision for developing the best version for the Online Impact Monitor considering different aspects such as benefits for the stakeholders, usage complexity of the tool, variety and dynamism of the data.

In the current version, some results from the Monitoring Report 2017 are used for the different mockups, examples from all relevant data selected for the stakeholders, that will be shown in the Online Impact Monitor. A graphical snapshot is available at the end of this deliverable.

The necessities for the data collection and visualization of the Monitoring Report 2018 will be taken into consideration for the further planning.
1 Introduction

One of the most important aspects for the BDV PPP is to boost the value generated by the usage of Big Data and it is our duty to show the impact the work of its members, both, the association, BDVA, and the projects, have on the whole ecosystem and beyond.

Each year BDVA is preparing a Monitoring Report (MR) about its activities showing the results achieved and the KPIs reached. This is requested based on the legal contractual agreement (CA) BDVA has signed with the European Commission. Background here is that the European Commission has the legal obligation to “monitor continually and systematically the implementation of Horizon 2020, to report annually and to disseminate the results of this monitoring”. More details can be found here¹

BDVe, the support action of the PPP, has in WP2, T2.4 Industrial Investment and Impact, the task to support the association in the monitoring of the KPIs in terms of impact. It is well understood that the overall responsibility of monitoring the KPIs remains with the association but BDVe is supporting here.

Activities in BDVe supporting this task already started early in the project (baseline survey in 2017) and then supporting the set-up of the KPI Monitoring Process for the MR2017. These activities are reported in D2.11, Section 4 [Ref1].

Following the activities mentioned previously the Online Impact Monitor is planned as an additional support “tool” to show the impact of the BDV PPP in terms of results achieved also in a visualised way.

The approach is considering different stakeholders that should be targeted for getting them involved into the PPP as well as the areas of most interest taking here into consideration the different interests from the different stakeholders.

Different approaches have been taken to show what an Online Impact Monitor (OIM) could be, starting from an infographic to more sophisticated tools, like CMS or Business Intelligence tools (see chapter 4). The analysis undertaken is not exhaustive in terms of analyzing all possible available commercial tools. We categorized the approaches in three different main categories: i) full-plain implementation starting from a Content Management System (CMS), ii) commercial Business Intelligence tools having embedded data analytics and data visualization capabilities, and iii) the Infographic that provides a quick snapshot and appealing visualization of the most relevant data. To be able to choose the best approach that provides value for the stakeholders and as well can be used to showcase the impact of the BDV PPP in an attractive and easy to use way, a thorough evaluation was done taking into consideration both, benefits and costs (see chapter 5).

As the first batch of projects (17) started in 2017, for the Monitoring Report 2017 already some results in terms of numbers (quantity) are available and were used for the Infographic (chapter 6), and also for the mockups presented (chapter 4).

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2 Targeted stakeholders and areas of interest

As already anticipated in the previous section it is important to show the results of the BDV PPP to all relevant stakeholders, in particular in terms of figures that show an impact and the progress of the results over the years. Using the Online Impact Monitor, impact and progress can be demonstrated at a glance capturing the interest of the different stakeholders.

European Commission (EC) is in this context a particular stakeholder as being partner in the PPP and – as already mentioned in the previous chapter – the PPP has the obligation to monitor its progress. Being able to show the figures at a glance will facilitate the promotion of results in different channels.

2.1 Stakeholders

The BDV PPP is connected to many stakeholders that are interested in getting information about what has been achieved in the BDV PPP in terms of impact and growth and for some stakeholders why it could be of interest joining the PPP either as BDVA member or as partner in a project.

The following table shows an overview of the stakeholders of the PPP and their main interests as well as the benefit the Online Impact Monitor can bring to them (Table 2):

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Interest</th>
<th>Added value of the tool</th>
</tr>
</thead>
<tbody>
<tr>
<td>EC</td>
<td>showing the results and the impact of the BDV PPP to different audiences</td>
<td>possibility of demonstrating the impact and progress of the BDV</td>
</tr>
<tr>
<td></td>
<td>(European parliament, EU Council, etc.) including press</td>
<td>PPP with visualised figures</td>
</tr>
<tr>
<td>BDVA</td>
<td>showing the results of the PPP in the main areas of interest: Jobs,</td>
<td>possibilities of showing the results achieved at a glance</td>
</tr>
<tr>
<td></td>
<td>Skills, Investment, SME involvement, environmental impact</td>
<td>immediately to all relevant stakeholders and using for press</td>
</tr>
<tr>
<td></td>
<td></td>
<td>communication</td>
</tr>
<tr>
<td>BDV PPP participants</td>
<td>showing the impact of their contribution in the project for their</td>
<td>possibility of showing the impact at a glance in the main areas</td>
</tr>
<tr>
<td></td>
<td>organisations and customers as well as to their national governments</td>
<td>of interest: job creation, skills, new businesses</td>
</tr>
<tr>
<td></td>
<td>and institutions</td>
<td></td>
</tr>
<tr>
<td>Companies</td>
<td>getting substantial information about the outcomes of the BDV PPP in</td>
<td>possibility of having the key figures at a glance and following</td>
</tr>
<tr>
<td></td>
<td>the sectors of interest such as skills and new solutions</td>
<td>the progress of the PPP in terms of impact</td>
</tr>
<tr>
<td>SMEs</td>
<td>getting information on areas of interest such as skills creation, new</td>
<td>possibility of getting relevant information at a glance showing</td>
</tr>
<tr>
<td></td>
<td>technologies and potential business partners</td>
<td>contribution of SMEs already being part of the PPP</td>
</tr>
<tr>
<td>NGO</td>
<td>getting information about achievements of the BDV PPP in terms of Job</td>
<td>possibility of getting the information at a glance</td>
</tr>
<tr>
<td></td>
<td>creation, skill building and environmental impact</td>
<td></td>
</tr>
</tbody>
</table>
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<table>
<thead>
<tr>
<th>Press</th>
<th>getting information about EC funding in the area of Big Data/Data economy, results and progress achieved, also related to economic and environmental impact</th>
<th>possibility of getting all relevant data at a glance, easier to use in press communications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Citizen</td>
<td>getting information about what is achieved with public funding: job growth, environmental impact, latest developments in data economy</td>
<td>possibility of having all information at a glance showing what has been achieved with public money</td>
</tr>
</tbody>
</table>

2.2 Areas of interest

Following areas of interest for the different stakeholders have been identified, mainly related to the topics that are already addressed in the Monitoring Report, but also some other areas that could be interesting, in particular for the stakeholders that are not involved into the BDV PPP. The measurement can be done quantitative or qualitative. For demonstration in a visual context, qualitative explanation will be added to the numbers.

2.2.1 Investment

Different categories of investment are interesting here:

- a) Public investment in the PPP (numbers from EC side)
- b) Investment from industrial side (numbers):
  - 1.) private expenditure in the PPP projects,
  - 2.) private investment in the context of the PPP but not related to PPP projects including follow-up investment after end of project
- c) Leverage factor public vs. private investment: absolute calculated number based on investment data
- d) Public investment through cascade funding (quantitative)

2.2.2 Jobs & Skills

For the Jobs & skills the main goal is to show (quantitative, some qualitative explanation):

- a) Number of Jobs created (and related context explanation):
  - 1.) total number,
  - 2.) percentage of actors of the PPP involved,
- b) New Job profiles created:
  - 1.) total number
  - 2.) percentage of actors involved from the overall PPP
  - 3.) examples of new job profiles
- c) Skills created:
  - 1.) numbers of new skills created,
  - 2.) percentage of PPP partners involved,
  - 3.) numbers of training courses (number of participants involved)
2.2.3 Innovation

The main innovation outcomes from the projects can be reported as follows:

a) New Systems and Technologies – overall: quantitative for each category (products, processes, instruments, methods, systems and technologies)
b) New services of high societal value: quantitative
c) Spin-offs (from projects) and startups (from accelerator projects): quantitative
d) Patents: quantitative
e) New Business models and scaling innovations: quantitative with qualitative explanation

2.2.4 SMEs

Of particular interest are the following points showing the impact the BDV PPP is having on SMEs:

a) Number of SMEs participating in PPP projects or being member of BDVA
   b) Types of SMEs:
      1.) size: 3 different sizes (result in percentage)
      2.) age: 3 different timelines (result in percentage)
      3.) geographical distribution (could be shown in a map)
   c) Turnover:
      1.) numbers for each year,
      2.) percentage for evolution
   d) Number of Employees:
      1.) numbers for each year,
      2.) percentage for evolution over time
   e) Public investment in SMEs (apart from cascade funding in Accelerator projects)

2.2.5 Outreach

The potential outreach of the BDV PPP can be demonstrated on different levels:

a) Collaborations with other international initiatives (see Figure 1) including the work on the SRIA: use here both numbers and qualitative description
   b) Collaboration with national initiatives: quantitative (number of collaborations)
   c) Communication activities: quantitative (number of events)
   d) Members of BDVA: quantitative (number and percentage of increase)
2.2.6 Experimentation

Here the aim is to report the number of all large-scale experiments as well as all use cases, with particular focus on the amount of data made available for the overall experimentation.

Data to be shown (quantitative):

a) Total number of large-scale experiments vs. number of experiments using private data
b) Total number of use cases vs. number of use cases using private data
c) Number of Data made available

2.2.7 Success Stories

Success stories make the KPIs tangible.
They can be reported currently only at qualitative level by mentioning them (numbers to be collected in next iterations). Examples are:

a) Development of new technologies
b) Successful experiments
c) New business opportunities
d) New partnerships
e) etc.

2.2.8 Environmental challenges

Stakeholders might expect that the usage of Big Data helps reducing the environmental impact for different categories. We should therefore report on

a) Reduction of CO₂ (percentage)
b) Reduction in waste (percentage)
c) Reduction of Energy use (percentage)
d) Reduction in use of material resources
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The percentage would be based on the projects working in this aspect. For MR2017 the two Lighthouse Projects, Transforming Transport and Data Bio contributed to the numbers.

The approach taken in this chapter in terms of stakeholders and areas of interest will be reflected with the BDV PPP ecosystem and all its stakeholders to clearly understand the value the Online Impact Monitor can bring to the community and if adaptations might be needed to be made with respect to the presented approach.

3 Data collection from KPIs

In alignment with the areas of interest identified in the previous chapter, we want to present here the data sources for the different areas of interest, in particular for those where the data is collected for the KPIs of the Monitoring Report, and that will then be demonstrated in the Online Impact Monitor.

For the different areas of interest, the figures from one or maybe more KPIs are collected to demonstrate the results and impact that have been achieved in this particular area.

Two other categories had been included into this chapter as they are important for the reporting to EC: SRIA and Macro-Economic impact. We will check how the data collected for these KPIs can be inserted into the Online Impact Monitor to be then visualised, if necessary.

3.1 Investment

Investment is one of the most important aspects to show the impact of the PPP, not only the public funding, but in particular the private investment that is done by all partners involved in the BDV PPP. Therefore, the first of the common KPIs – I.1 Mobilised Private Investment – is dealing with the aspect of the investment from the private side of the PPP. This KPI contains information on following points:

- Total amount of actual private expenditure mobilised in BDV PPP projects
- Estimation of private investment mobilised in other R&D activities related to the BDV PPP, including investments after the end of the projects.

For these points in the questionnaire following questions for data collection were indicated:

- Turnover, employment and overall R&D Expenses (regional coverage Europe)
- Estimation of the total amount of R&D expenses that are related to Big Data (BDV SRIA). 4 sub questions complement this one:
  - Estimation of the amount of R&D expenses that are related to the Big Data PPP but are not related to EU-funded projects.
  - Estimation of the amount of R&D expenses resulting from follow-up investments of projects funded by the EC that are topic-wise related to the Big Data PPP, however initiated outside the Big Data PPP (in FP7 or in H2020) (excluding any expenses that have been funded by the EC)
  - Estimation of the amount of R&D expenses resulting from follow-up investments of projects funded by the EC that are not related to the Big Data PPP.
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investments of Big Data PPP projects (Excluding expenses that are funded by the EC) (only for participants in BDV PPP projects)

- Calculation of actual overhead costs and BDV PPP project-related expenditure mobilised (in BDV PPP projects). (only for BDV PPP project partners)

The detailed questionnaire is confidential and cannot be indicated in this document as being public.

We will discuss with BDVA which numbers should be visualised to show the impact of the PPP in terms of investment.

3.2 Jobs & Skills

Basis for the numbers reported in this area are the figures collected for the KPIs

- I.2: Number of jobs created
- II.2: Number of Data Companies (Macro-economic)
- II.5: Increased number of European Data workers (Macro-economic)
- II.8: High establishment availability of big data value creation skills development

Only the combination of these 4 KPIs is providing the full overview about the jobs, job profiles and skills created.

KPI II.8 is composed of different sub-KPIs:

- Number of training programs established arising from cPPP.
- Number of European training programs involving 3 different disciplines arising from cPPP.
- Number of Master and PhD students involved in PPP projects.
- Number of dissemination events, seminars, conferences organised in cPPP projects (including number of participants).
- Number of other actions that contribute to this topic and not reported in as part of I.2 or II.8.

3.3 Innovation

Innovation is targeted with different KPIs

- I.4: Number of significant innovations to market
- II.7: New economic viable services of high societal value
- II.17: New systems and technologies

“A combination of the input provided in the 3 KPIs (I.4, II.7 and II.17) is needed to have a full overview about all innovation created in the BDV cPPP projects that has an exploitable and marketable value, is a new system/technology beyond state-of-the-art and, as some of them, address also a high societal value.” [Ref2].

3.4 SMEs

The impact of the BDV PPP on SMEs is measured with two KPIs:
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- I.3: Increase turnover in companies and in particular in SMEs
- II.18: Participation and benefits for SMEs

KPI I.3 was addressed in the way of measuring the “impact of a cPPP on SMEs”, both in terms of Euro and quantitative analysis.

3.5 Outreach

There is no direct KPI defined for the outreach, the information is collected on a qualitative basis in the survey sent out to the members of the PPP – see Section 6 of the survey reported in i.II. The outcome is then reported in Section 2.2 of the Monitoring Report.

The collection is done manually, and the numbers for the highlights are then calculated by BDVA based on the input provided (more details are then reported in Annex 4 of the MR, which is confidential).

We will make some suggestions in chapter 6 on how the collected data could be visualized to provide interesting insights on the outreach of the PPP.

We would also include II.13: Support Major Sectors and major domains by Big Data technologies and applications in this area of interest showing in how many sectors BDV PPP partners are working and by that having an impact.

3.6 Experimentation

Following KPIs are contributing to the figures in this area

- II.11: Large Scale experiments conducted in cPPP projects and i-Spaces involving closed data
- II.12: Uptake of BDV use cases and experiments
- II.14: Amount of data that has been made available for experimentation (cPPP projects and i-Spaces)

and by that showing the results and also the amount of data used, including private data (see II.11 and II.12).

For the data throughput also KPI II.16: Increase the data throughput compared to 2014, is interesting. For MR 2017 a number has been reported but starting from 2018 DataBench Project will work on this with the projects.

3.7 Success Stories

There is no KPI related to Success Stories, they are currently collected in Section 6 of the survey (see i.II) by answering an open question.

General information such as development of new technologies/systems, first successful experiments and outcomes, publications and engagement activities are provided in Section 2.2 of the Monitoring Report (the official part), more detailed information about the Success Stories can then be found in Annex 4 of the Monitoring Report which is confidential.

We will suggest some ideas on how success stories could be visualised in an infographic in chapter 4.
3.8 Environmental challenges

The contribution to environmental challenges is addressed in following KPIs:
- II.6: Contribution to the reduction of energy use
- II.19: Contribution to the reduction of energy use and CO2 emissions
- II.20: Contribution to the reduction of waste
- II.21: Contribution to the reduction in the use of material resources

3.9 SRIA Update and Implementation

Following KPIs are used to measure the implementation of the SRIA:
- II.9: Ensure efficiency, transparency and openness of the cPPP’s consultation process
- II.10: Ensure that technology progress is in line with multi-annual roadmap of SRIA

The KPIs for the SRIA are important for the Monitoring Report and will be considered for the Online Impact Monitoring tool to support BDVA in the creation of the numbers. However, visualization of this information is difficult, and we will check which numbers, maybe text, might be interesting to be included into the messages for the outreach.

3.10 Macro-Economic Results

Following KPIs are contributing to the overall assessment of the macro-economic impact the BDV PPP is having:
- II.1: Market share of the European Union in the global Big Data Market
- II.2: Development of the number of Data Companies in the EU
- II.3: Development of the revenue of Data Companies in the EU
- II.5: Development of the number of Data Professionals in the European Union

The general macro-economic data is provided by IDC and specific data is collected from BDV PPP projects and BDVA members – see Section 4 of the survey (in i.II). These KPIs are important for the Monitoring Report; we will therefore check how they can be integrated into the Online Impact Monitoring Tool for facilitating the work of BDVA when extracting data for the MR.

4 Potential approaches and related tools

The data and content for the Monitoring Report is collected through surveys/questionnaires sent out by BDVA to both, PPP projects and BDVA members as all members of the BDV PPP are obligated to contribute. The processes and responsibilities of the Monitoring Report are outlined in detail in Del. 2.11 [Ref1]. The example for the survey sent out for the Monitoring Report 2017 can be found in i.II. All questions in the survey are related to the different categories and the related KPIs – see previous section.
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Based on the current data available, different approaches can be taken to manage and visualize the data and content collected for the Monitoring Report and we have categorized them in three main categories:

1. A fully functional version, starting from a Content Management System (CMS) include the Business Intelligence (BI) functionalities to group the data and visualize them in different ways (table, graphs, pies, etc.), leaving the user the possibility to choose how the data should be visualized;
2. a full BI and analytics tool that provides the functionalities to collect, organize and visualize the data in a very powerful way, and that has the feature of an interactive dynamic visualization;
3. a simple as well efficient data representation, still in graphical and appealing manner, showing a summary of the main content extracted by the Monitoring Report and a set of infographics, each one for a specific area of interest, if necessary, with more detailed textual information gathered from the Monitoring Report.

In addition to the proposed approaches also the governance aspect (who has the overall responsibility of the data and decides on what can be published in the OIM) has to be considered in this context.

We have done a thorough analysis of all categories as presented in the following subchapters to be then able to take a final decision on the best approach (see chapter 5 and 6). To make all categories more tangible we did not only describe in a comprehensive manner the approaches and categories, but we created also Mockups for each of them. The final version of the Online Impact Monitor will then have a slightly different outlook.

4.1 CMS based approach

The CMS based approach relies on the following three data-preprocessing steps:

1.) Data Collection
2.) Data Grouping
3.) Data Visualisation

4.1.1 Data Collection

The approach would be to have all questions from the survey (see i.II) that is sent to all PPP partners for the data collection for the Monitoring Report online. Input for each question can be both, numbers and related text.

Each question is associated to a KPI (see also example from MR2017 questionnaire in i.II).

Most of the answers could be classified as structured data (numbers, percentage, etc.) but the remaining answers often are free text. Therefore, appropriate tools that are able to collect structured and unstructured data (e.g. text from word processing, table or spreadsheet) are needed.

The starting point would be the raw data that constitute the basis for the Monitoring Report (all data have been collected through an online questionnaire and in a spreadsheet for all the PPP partners) and then to import automatically all data in the
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Excel in an indexed database (e.g. Caspio tool that convert Excel in a portal database, tagging each information so that it can be aggregated and visualized later on).

4.1.2 Data Grouping
Once the data are collected through automatic tools, and each of them tagged for grouping purposes (e.g. visualization permission, or when a total amount is requested to be visualized, etc.), the raw data have to be grouped in clusters for the different KPIs into the related areas of interest (see KPIs per category in chapter 3). Effective data tagging enables the use of a small number of data descriptors or themes to organize and optimize small to extremely large amounts of information. Figure 2 shows a simple relationship between the raw data (items), the tags and the data shown to the users (stakeholders).

![Figure 2 – Example of tagging system](https://howto.caspio.com/tables-and-views/importing-data/)

The system is automatically putting the figures in the right category and calculating the final figure to be shown for each KPI and category, if a total amount has to be shown. In some cases, it will be possible to present also the detailed information that contributed to the total amount, both complemented by unstructured data as textual explanations (e.g. # of new job profiles created and the list of the job profiles).

A correct tagging will permit the user (stakeholder) to group (combine) different data for the area of interest or category and visualize in the most appropriate way.

For example, having a full understanding about new Jobs & Skills created within the activities covered by BDV-PPP, comprises a combination of different KPIs (jobs created, # of Data Companies, skills development).

Most visualizations would be tables where the data are aggregated for different filter categories (e.g. years). If the data, thanks to a filter selection, will permit to have a more granular representation, there would also be the possibility to get some charts, pies, graphs, etc.

Figure 3 Figure 3 shows the aspect that the Online Monitor Report could have. It should be part of the BDVA Portal, possibly accessible under the BDV-PPP menu where also the BDV PPP Monitoring Report can be assessed.
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Accessing the Online Impact Monitor from the BDV PPP menu the entry page could have the following layout and menu (see Figure 4).

4.1.3 Data Visualisation
For each category the numbers are available once all data is inserted. Upon approval of BDVA the data could then be used for the visualisation (see also related chapter 4.2 on governance).
The main page of the Online Impact Monitor could contain all areas of interest where it would be possible to visualize the related needed information about the specific area of interest as shown in Figure 5.
Figure 5 - Online Impact Monitor main menu

When clicking on one area of interest a pop-up menu would appear with the possible available data for this particular area of interest. For example, if in the main menu (as shown in Figure 5) the information about jobs created is selected a sub pop-up list appears with more selection details as shown in Figure 6 (# of new total job created, # of new job profiles created and if needed, more detailed information appears such as the list of the new profiles, and/or the distribution among BDVA members and BDV-PPP projects). In Figure 6 on the right side a filter area permits the stakeholder to have more specific information contextualized by the selected filter (multichoice could be possible).

Figure 6 - Jobs & Skills area of interest

Due to the data tagging done during the collecting and grouping phases, it is possible to visualize for the same data different visualizations permitting statistics with more added value.
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Figure 7 shows the example of the search of “Turnover” under the SMEs area of interest, providing a total amount and the possibility to have more detailed information. Clicking on the “Read More” button, in fact, it is possible to display more detailed information related to the turnover per different ages of SMEs - (Figure 8). In addition to that, it is also possible to filter the visualisation request per years for example – see Figure 9, where the evolution of FTE per years is shown.

![Figure 7 - SMEs annual turnover visualization](image1)

![Figure 8 - SMEs more details on turnover](image2)
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Figure 9 - Number of employees per SMEs participating in PPP projects

Most visualization would make use of tables when needed to have a snapshot of the evolution of the represented data (e.g. the evolution of the different kind of private investment in BDV-PPP over time).

When a different, more in depth, view of the data might be necessary to be demonstrated via graphs, pies or dashboards, the Online Impact Monitor could be interfaced with external Online KPIs Dashboard & Tools. These tools would through APIs collect, group, organise and visualize the impacts for the particular area of interest leaving the user the choice to choose the desired visualization (the same data could be represented in graphs, columns, pies etc.). We have analysed different external Business Intelligence (BI) tools (e.g. Intersect³, SimpleKPIs⁴, Tableau⁵, etc.) that could provide such extended visualization features.

There are some areas of interest such as Success Stories where no specific data visualization could be done; in that case the user (stakeholder) would have access to a list of success stories and clicking on one of them he/she would get a static pdf page with all useful and public information.

4.2 Business Intelligence approach

An alternative and more effective approach to interact with the data and content collected for the Monitoring Report (see chapter 4.1.1) and visualize them for each area of interest, could be the adoption of one of the most used and advanced commercial analytic suites, such as QLIK⁶, SAP Lumira⁷, SAP Cloud Analytics⁸, or

³ https://www.inetsoft.com/products/StyleIntelligence/
⁴ https://www.simplekpi.com
⁵ https://www.tableau.com/solutions/business-dashboards
⁶ https://www.qlik.com/us
⁸ https://www.sapanalytics.cloud
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Tableau, all of them, with slightly different features. These are a very powerful Business Intelligence (BI) tools with analytics and views features that provide everyone accessing the dashboard the possibility to check all available data. Most of these BI tools are usually a suite of different applications, each one devoted to a specific need (data capturing, data analytics, data visualization, etc.).

To show a potential outlook, we have developed some mockups, starting from QLIK Sense, a tool already used in the European Commission for the H2020 projects (https://webgate.ec.europa.eu/dashboard/sense/app/93297a69-09fd-4ef5-889f-b83c4e21d33e/sheet/erUXRa/state/analysis)

Similar to the approach described in section 4.1, the data need to be collected from the survey done for the Monitoring Report and a tool like QLIK provides a set of APIs to embed visualization and data in the Online Impact Monitor.

Figure 10 shows a possible snapshot of how the Online Impact Monitor with an overall visualization for the area of interest “Investments” could appear.

A powerful tool like QLIK Sense or SAP Analytics, LUMIRA, etc. permits to interact with each of the visualization areas (graph, bars, table) obtaining, for each selected data, more detailed information rearranging in that way, in real time, the displayed contents on the pre-defined visualization areas.

Figure 11 provides an example for one of the PPP projects, Transforming Transport. In fact, if the user clicks on the H2020 call-id (that is a data collected for the Monitor Reporting) as shown in Figure 10, the dashboard changes the data visualized according with the visualization in the other areas (boxes): the name of the BDV-PPP projects belonging to such call-id, the total private investment in PPP projects, the topics of the PPP projects, etc.

![Figure 10 - Main Menu using QLIK view](image-url)
The use of one of the tools previously mentioned, would also provide additional features such as having an interactive summary infographic where the main contents are displayed as in a usual infographic, but with the possibility to have detailed information when just clicking on the map or on the bar graph. Figure 12 and Figure 13 provide an example of this aspect of having such an interactive infographic.
4.3 Infographic approach

The third option for an Online Impact Monitor would be the visualization in an Infographic based on the high-level data collected (as described in chapter 4.1.1) In this way the stakeholders will be provided with a snapshot of the most important impacts.

Infographics go along with data visualization and communicate information by a visual representation of a story. These graphics artistically enhance the given information. Infographics interpret information by visual storytelling.

The infographic (or a set of infographics) is a static representation of the Top-rated data that will be highlighted with a mix of text and graphical items. In the case of the Online Impact Monitor, it is a way to summarize the important content detailed in the Monitoring Report.

When designing infographics there is a number of aspects to be considered which affect the topology in which the data should be displayed, the balance between text and data, the art design selected and the so-called infographic flow.

- **Topology**: It refers to the way in which data is displayed. Some examples are tree, sections, timeline, map, etc. and it depends heavily on the nature of data.
- **Balance**: Being factual is a must, so generally speaking data should be highlighted over text. However, and due to the nature of the data displayed, some clarification text could act as glue to help the full infographic understanding. To find the correct balance is a key element for a good result.
- **Art design**: It should help to make the data speak and to the interconnection between the different sets of data displayed. There are also several different options ranging from the use of colours and fonts as the main elements, illustrations, real photographs, 3-D structures, etc.
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- **Infographic Flow**: It is probably the most relevant element when designing. The raw data should be curated and organised into a rational flow that tells a story – and this story attracts the audience to follow the flow and get the full information contained in the piece.

Figure 14 serves as an example on how the data could be presented. Following data have been collected from the Monitoring Report MR2017_BDV_PPP_Main Report_September 2018_0 [Ref1]:

1.) Investments area: data shown in the bar graph taken from page 14.
2.) Jobs and training: values taken from page 15,
3.) Innovation: value from page 18,
4.) Number of SMEs involved in PPP projects: from KPI II.18 page 33.
5.) The remaining data are part of the introduction of the above-mentioned document MR2017_BDV_PPP_Main Report_September 2018_0.

The data used for the Infographic can also be found in i.III.

![Monitor Report Infographic](image)

*Figure 14 - BDV PPP Impact Infographic*
Given the nature of an infographic, this approach will not be exhaustive in terms of information provided; a minimum in case of selecting this approach would be to have several infographics displayed, one for each area of interest. Figure 15 shows an example of a specific infographic for the area of SMEs. As for Figure 14 the data displayed are collected from the Monitoring Report MR2017_BDV_PPP_Main Report_September 2018_0.

As already said before the above figures serve as examples for the infographic.

For all three categories, as described in this chapter, the overall responsibility of the data to be published will remain with BDVA. This has to be considered also in the setup/choice of the tool providing a clear structure on who will be able to access the data for further handling and who will only be able to insert data for the results.
5 Opportunities and Constraints

As said, the overall goal of the Online Impact Monitor is to show the impact the BDV PPP is having on different levels and providing this information to all interested stakeholders in an appropriate way.

The approaches and tools described in the previous chapter 4 have different implications in terms of resources and costs as well as attractiveness for the different stakeholders.

For being able to take our decision of which approach/which tool to select, we have analysed different aspects, the attractiveness/value for the stakeholders (chapter 5.1) and the resources needed in terms of implementation effort, skills, costs (e.g., for licensing) as well as the format of the data made available (chapter 5.2).

5.1 Stakeholder value

To understand which tool brings which value to the stakeholders, we analyzed the proposed categories in terms of pros and cons of the functionalities offered – see results in Table 3 (for CMS based OIM), Table 4 (for interactive BI dashboard) and Table 5 (for the Infographic). The important points in this analysis were to understand what could be provided to the stakeholders through which tool that would make sense in terms of really attracting the different stakeholders.

<table>
<thead>
<tr>
<th>CMS based OIM</th>
<th>Pros</th>
<th>Cons</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1. Development based on the actual BDV-PPP/BDVA Website tools (Wordpress or Drupal)</td>
<td>1. No interactive dashboard</td>
</tr>
<tr>
<td></td>
<td>2. Visualize the contents with the embedded functionalities of the tool (e.g. Wordpress)</td>
<td>2. Difficult to correlate the data in a simple way</td>
</tr>
<tr>
<td></td>
<td>3. No combined visualization, providing a unique view</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Interactive BI dashboard OIM</th>
<th>Pros</th>
<th>Cons</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1. Powerful tool</td>
<td>1. Different applications inside the tools like QLIK suite are needed (Data Catalyst for collection, Data Analytics for BI over the data, Data Visualization for the dashboard)</td>
</tr>
<tr>
<td></td>
<td>2. Interactive visualization</td>
<td>2. For users like citizens, Public Administration, NGOs, etc.) usability could be complex in terms understanding the visualized results</td>
</tr>
<tr>
<td></td>
<td>3. Highly flexible</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4. Provides features that permit to identify the relations among data</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5. Possibility of accessing the visualization also through apps</td>
<td></td>
</tr>
</tbody>
</table>
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Table 5 – Infographic approach pros & cons

<table>
<thead>
<tr>
<th>Infographic OIM</th>
<th>Pros</th>
<th>Cons</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1. Easy to implement</td>
<td>1. clustering of the contents is “human dependent”</td>
</tr>
<tr>
<td></td>
<td>2. A bird’s eye view on the hot topic contents</td>
<td>2. No possibility of adding additional information to each of content visualized.</td>
</tr>
<tr>
<td></td>
<td>3. Content easy to understand for everybody</td>
<td>3. New input data imply new infographic development</td>
</tr>
</tbody>
</table>

5.2 Resources, costs and data

In addition to the aspects related to the usability of the different tools as described in the previous chapter, other important aspects to be considered are the resources needed in terms of implementation efforts, skills and costs (e.g., for licensing) of the different tools as well as the format and the quality of the data made available by the data collection for the Monitoring Report.

Following a short explanation of the different aspects taken into account:

- **Skills**: here we consider the skills needed, within the BDVe consortium, to develop an Online Impact Monitor and the knowledge of the different approaches previously described in terms of feature capabilities;
- **Implementation effort**: this aspect refers to the effort needed to implement one of the previously described approaches. The implementation effort depends on the complexity of the solution and how easy the programming using the developing features of each tool can be done;
- **Costs**: this aspect is mainly related to the licensing costs that could be high for a whole complete solution like in the case of a BI tools where the usage of different applications within the BI suite should be possible;
- **Data Format**: this parameter refers to the quality of the data and/or how much unstructured data is available that will impact the data collection and data grouping to create metadata.

Table 6 provides an analysis indicating with High, Medium and Low the indicators for each aspect addressed both in chapter 5.1 and chapter 5.2 for the different categories.

Table 6 - Comparison Matrix

<table>
<thead>
<tr>
<th></th>
<th>Implementation effort</th>
<th>Skills needed</th>
<th>Commercial costs (e.g., license)</th>
<th>Current Data Format Modification needed</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMS based approach</td>
<td>High</td>
<td>Medium</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>Interactive BI approach</td>
<td>Medium</td>
<td>High</td>
<td>Medium/High</td>
<td>Medium</td>
</tr>
<tr>
<td>Infographic approach</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low (input: Monitoring Report)</td>
</tr>
</tbody>
</table>

As can be seen in Table 6, the more sophisticated tools are in the area of medium-to-high for the indicated resources. But would their implementation really bring more
value in terms of showing the impact the BDV PPP is bringing for the different stakeholders?

6 Online Impact Monitor

From the information provided in the previous chapter, it could be deducted that the Interactive BI approach might be the most valuable one for the stakeholders in terms of getting the most information, and the static infographic the least appealing one. But is this the truth? Here some points to be considered:

- As generally accepted when we deal with Big Data Management, we have to deal with 5 important keys: Volume, Velocity, Variety, Veracity and Value.
- For the Online Impact Monitor we have to consider that the Volume is not so high, as well as the speed the data changes (once a year when being collected through the Monitoring Report).
- Infographics and data visualization help the stakeholders understand complex topics through graphics. These graphics are simple to use and are easy to share on websites and social media platforms. As people have a much shorter attention span nowadays, graphics are the perfect way to get their attention, even if it is just for a quick moment.

Therefore, a BI tool, that at first glance might be the best option to present the data of the Monitoring Report, is not useful in our case as its overall competitive advantage lies in the ability to manage very dynamic and variable data over time (we have data available only once a year). Moreover, a BI tool, such as QLIK or other similar ones, offers a user interface that for the majority of the stakeholder could most probably be too complex and time consuming to manage and the added value might be questioned as the data remain unchanged for a long time period (1 year).

Taking the above points into consideration, we decided that the best cost/benefits approach is to implement an attractive and full of content Infographic. This can also be underlined through studies conducted about how the brain is capturing information and highlighting that visual information supports a longer memory as well as supports more attention for the content (some sources can be found in this graph: [https://neomam.com/interactive/13reasons/](https://neomam.com/interactive/13reasons/)).

A well-designed Infographic and the right choice of the content are able to provide to a wide and varied number of stakeholders the most important information with the aim to show the impact all members of the cPPP, both projects and BDVA members are having in the different areas.

For this reason, what we consider as the most important content have been extracted from the Monitoring Report MR2017_BDV_PPP_Main Report September 2018 [Ref1] providing a general snapshot of the achievements. The infographic will span from general results achieved that are of major interest for the majority of the stakeholders, to the results achieved by BDVA members thanks to the cPPP, through the impact on SMEs and the Success Stories supporting these impacts. The list of the

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different contents and the key messages that we want to provide for each area of interest is detailed in the Annex i.IV.

The production of the OIM infographics will be split in three different steps:

- Production of a single general static infographic piece in pdf format, both in digital and ready-to-print versions gathering all available information extracted from the Monitoring Report.
- Production of a series of smaller static infographic pieces, also in pdf format, devoted to segmented topics extracted from the global data.
- Production of a dynamic infographic piece with animated elements which will be programmed in html format to be included in the BDV PPP website, fully responsive and directly accessible from any device, including desktop and laptop PCs, tablets and smartphones.

Figure 16 shows a partial snapshot of the whole Infographic showing how the Online Impact Monitor will look like once released online in Q2 2019, highlighting the main achievements and the impact produced.

For integration and visualization reason, due to the structure of the produced Infographic, it could not be inserted into the deliverable, but the full version can be seen at www.big-data-value.eu/oim.
7 Implementation Roadmap

Figure 17 covers the tentative timeline for OIM production targeting Q2 2019. The objective is to have available, as explained above in chapter 6, before the end of Q2 2019, the Single Static Infographic, a series of small Infographics with detailed information for a subset of topics extracted from the Monitor Reporting MR2017 and the dynamic infographic ready to be included in the BDV PPP website. Once the Monitoring Report 2018 is available in an approved version (planned for June 2019), a second version of the Infographic with new and updated data will be put online.

Figure 17 - Online Impact Monitor timeline

8 Conclusions and next steps

The aim of the Online Impact Monitor is to easily get relevant data from the KPIs that can be visualized and be used for the promotion of the impact and the results of the PPP to all relevant stakeholders.

Based on the Monitoring Report 2017 that was finally published in October 2018 different mockups have been produced to visualize the different approaches presented in chapter 4.

After a thorough analysis of the different available approaches (chapter 4) and taking into account what is the best cost/benefit approach (chapter 5), we decided to go for the Infographic as Online Impact Monitor.

As explained other tools that are normally used for dynamic often changing data, are not useful in our case. Once the Infographic will be released with the MR2017 data (in Q2 2019), we will be able to test with the whole BDV community the acceptance and the interest. The launch of the Online Impact Monitor will be announced with a press release containing key data and hot messages.

Our aim is to have also a complete set of detailed infographics (for each area of interest) that can provide more niche information for specific stakeholders. The objective is to highlight all achievements and results of the PPP and described in the Monitor Reporting.
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9 References

[Ref1] Del. 2.11 Intermediate Report on Sector workshops, webinars and votings

[Ref2] Monitoring Report 2017 Big Data Value cPPP:

[Ref3] BDV Strategic Research Innovation Agenda V4.0:
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Annexes

I. Annex 1 – BDV cPPP KPIs

The KPIs are reported in the BDV Strategic Research Innovation Agenda (SRIA) [Ref3] and are listed here for easy access.

Common KPIs

I.1 Mobilised Private Investment
Data Collection:
Estimation of the total amount of R&D expenses that are related to Big Data (BDV SRIA). 4 sub questions complement this one:
- Estimation of the amount of R&D expenses that are related to the Big Data PPP but are not related to EU-funded projects.
- Estimation of the amount of R&D expenses resulting from follow-up investments of projects funded by the EC that are topic-wise related to the Big Data PPP however initiated outside the Big Data PPP (in FP7 or in H2020) (excluding any expenses that have been funded by the EC)
- Estimation the amount of R&D expenses resulting from follow-up investments of Big Data PPP projects (Excluding expenses that are funded by the EC) (only for participants in cPPP projects)
- Calculation of actual overhead costs and BDV PPP project-related expenditure mobilised (in BDV PPP projects). (only for BDV PPP project partners)

I.2 Number of Jobs created
This KPI is split in 2 different sub-KPIs:
- a) Job creation (quantitative value and qualitative description of causality)
- b) Job profiles established and skills created by 2023 (quantitative value and qualitative description)

I.3 Increase turnover in companies and in particular in SMEs

I.4 Number of significant innovations to the market
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**Specific KPIs**

II.1 Market Share of the European suppliers of the global Big Data Market (Macro-economic)
II.2 Number of Data Companies (Macro-economic)
II.3 Revenue generated by European Data Companies (Macro-economic)
II.4 Enabled advanced privacy and security respecting solutions for data access, processing and analysis
II.5 Employment/Increased number of European Data Workers (Macro-economic)
II.6 Contribution to the reduction of energy use
II.7 New economic viable services of high societal value
II.8 Higher establishment availability of big data value creation skills development
II.9 Ensure efficiency, transparency and openness of the cPPP’s consultation process
II.10 Ensure that technology progress is in line with multi-annual roadmap of SRIA
II.11 Large Scale experiments conducted in cPPP projects and i-Spaces involving closed data
II.12 Uptake of BDV use cases and experiments
II.13 Support major sectors and major domains by Big Data technologies and applications
II.14 Amount of data that has been made available for experimentation (cPPP projects and i-Spaces)
II.15 Availability of metrics for measuring the quality, diversity and value of data assets
II.16 Increase the speed of data throughput compared to 2014
II.17 New systems and technologies
II.18 Participation and benefits for SMEs
II.19 Contribution to the reduction of energy use and CO2 emissions
II.20 Contribution to the reduction of waste
II.21 Contribution to the reduction in the use of material resources

**Programme-Level KPIs**

III.1 Patents
III.2 a) Standardisation activities (project level)
       b) Contributions to new standards (PPP level)
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II. Annex 2 – Questionnaire for data collection for MR 2017

This version of the questionnaire for the survey for collecting data for the MR 2017 had been shared with BDVe to include also the aspects of the Innovation Marketplace.

To prepare the ground for the setup of the Online Impact Monitor Tool the questions are tagged to the related KPI.

BDV cPPP projects survey 2017 (Monitoring Report 2017)

The purpose of this questionnaire is to collect data of all BDV PPP projects in order to complete the annual monitoring report for the contractual Public Private Partnership (cPPP).

The cPPP-Monitoring Report is a joint report of the EC Unit responsible for the cPPP and the BDVA as the contractual partner of the European Commission.

Section 0: Master Data

1. Name of your project:
2. H2020 Call topic addressed by your project:
3. Starting date and duration (in months) of your project:
4. Name of organization of the project coordinator:
5. In case we have any questions to your answers we would like to ask you to provide your name and Email address:

Section I: job creation, job profiles and skills development
(Contributes to KPI I-2, II-5 and II-8)

6. Does your project contribute to job creation? (Job creation forecasted within a reasonable timeframe in the future, 3 years after H2020 ends) (Yes/No)

7. If yes, can you provide an estimation of the impact of your project in job creation forecasted within a reasonable timeframe in the future (or at least until 2022)? (Please provide some explanations or evidence to support your reply). (Open question. Please provide quantitative and qualitative answer if possible)

8. Does your project contribute to increase the number of data workers in Europe? (Yes/No?)

9. If yes, please provide some qualitative statements about how your project is contributing to increasing the number of data workers in Europe? (Please refer as much as possible to activities developed during year 2017) (Open question. Qualitative answer)

10. Does your project contribute to the creation of new job profiles? (Yes/No?).

11. If yes, How many complete new job profiles have being established by your project in 2017? Please list them (number + description)

12. If yes, How many complete new job profiles do you estimate that will be created at the end of the project? Please list them (number + description)
13. Does your project contribute to the creation/development of new skills? (Yes/No).

14. If yes, explain how your project has contributed to the development/creation of new skills during 2017, and list the new skills developed. (open question)

15. Number of Master students involved in your project in 2017 (number)

16. Number of PhD students involved in your project in 2017 (number)

17. Please indicate in which way your project has contributed and will contribute to the Skills Agenda for Europe\textsuperscript{10}:
   i. During 2017. .................................................................
   ii. Forecasted 2018+. ...........................................................

18. Number of training activities (such as tutorials, webinars, etc.) organized by your project in 2017:

19. Number of training programs established by your project in 2017 (include number of programmes, list them and indicate participants per programme)

20. Number of European training programs involving 3 different disciplines by your project in 2017 (include number of programmes, list them and indicate participants per programme)

Section II: Innovations and technical results
(Contributes to I-4, II-4, II-7, II-10, II-13, II-15, II-16, II-17)

Innovations to market

The European Commission has requested all the cPPPs to measure what is called “Number of significant innovations to market”. This KPI concerns all developed items that have a \textit{marketable value}, including products, processes, instruments, methods, and technologies. It should involve all items \textit{directly linked to the cPPP projects as developed foreground}, as well as any items beyond the scope of the project that is linked to the foreground.

We are asking the projects to list and briefly described all developed foreground, tangible and intangible assets, that have a marketable or at least an exploitable value, including (not only) products, processes, instruments, methods, and technologies.

(Note 1: Further information by EC: It should involve all items directly linked to the cPPP projects as developed foreground, as well as any new foreground beyond the scope of the project that is linked to the project results (most likely through IP). Information on innovations ready to be taken to the market would be an asset given that the EU seeks opportunities to stimulate more interest by investors. Also other activities could be considered to carry value added, especially at lower technology readiness levels, such as advancement of a certain technology, clustering, and standardisation. However, the measurability must contain some exploitable value. As an example, a (part) contribution to an industrial standard which has an intrinsic value as a method on the market would count as an innovation.)

(Note E 2: Information gathered through this section will be shared with the BDVe projects (BDV PPP CSA) with the purpose of identifying innovations developed by projects ready to be promoted by the BDV PPP Market place)

\textsuperscript{10} http://ec.europa.eu/social/main.jsp?catId=1223
21. Please list and describe all the Innovations with marketable or exploitable value developed by your project during 2017 (as described above). Please include for each of those innovations:

- Short name
- Type of innovation (e.g. technology, system, methods, product, service, methods, instruments, processes, other)
- Brief description
- Description of the marketable/exploitable value
- TRL (if applies)
- Sector (if applies)

European provision of big data value creation systems and technologies

The Big Data Value Contractual agreement also incorporates a KPI (specific to this Big Data programme) called: “Increased competitive European provision of big data value creation systems and technologies”. For this we are asking the project to provide information about the “Number of systems and technologies developed in the relevant sector in cPPP projects (beyond state of the art)”

Theoretically this input should be a subset of your answers to the previous question.

22. Number of systems and technologies developed in the relevant sector in the project during 2017 (include short description) (if answer to this question is embedded in “Innovations to Market” please indicate so)

Support major sectors and major domains by Big Data technologies and applications

23. List the sectors and major domains supported by Big Data technology and applications developed in your project (e.g, mobility, healthcare, transport, bio-economy, etc) (open answer)

Enable advanced privacy and security respecting solutions for data access, processing and analysis

24. Number of patents filed by your project that enable advanced privacy and security respecting solutions for data access, processing and analysis:
   a. Year 2017
   b. Forecasted 2018+

25. Number of publications by your project that describe advanced privacy and security respecting solutions for data access, processing and analysis:
   a. Year 2017
   b. Forecasted 2018+

26. Number of OSS contributions/ products/ SW components resulting from your project that enable advanced privacy and security respecting solutions for data access, processing and analysis (number and brief description):
   a. Year 2017
   b. Forecasted 2018+
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New economic viable services of high societal value

27. Number of new economically viable services of high societal value developed or resulting from your project (number and brief description per service):
   a. Year 2017:
      i. Number
      ii. Description per service (describe why something qualifies)
   b. Forecasted 2018+
      i. Number
      ii. Description per service (describe why something qualifies)

(Note: Criteria for “high societal value” should be up to the project. Project should describe why something qualifies)

Technology progress is in line with multi-annual roadmap of SRIA

With this KPI we intend to measure % of research priorities covered compared to overall scope of research priorities defined in SRIA (differentiate running, upcoming and not covered yet).

To answer this question, you need to use as reference the BDVA SRIA v.4.

Applications/Solutions: Manufacturing, Health, Energy, Transport, BioEco, Media, Telco,

(overview in chapter 2.3, reference model)
(Note: This information was initially shared by some of the projects through the BDV Technical Committee. Please contact the person representing your project at the Technical Committee. Chairs of the TC and BDVA T6 leads will be in charge of assessing results of your input)
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28. Number of contributions to the Technical aspects of the BDV SRIA (beyond state of the art)?
   a. Contributions to Data Management
   b. Contributions to Data Processing Architectures
   c. Contributions to Data Analytics
   d. Contributions to Data Visualisation and User interaction
   e. Contributions to Data Protection
   f. Contributions to Big Data Standardisation
   g. Contributions to Engineering and DevOps for Big Data

Per contribution please indicate whether sub-level according to SRIA (e.g in Analytics, predictive Analytics), and indicate whether is a finalized, ongoing or planned contribution.

Availability of metrics for measuring the quality, diversity and value of data Assets (Note: Results of this questions will be shared with the BDV PPP DataBench project)

29. Are you assessing quality, diversity and value of data assets? (YES/NO?)
30. If yes, what metrics are you collecting to quantify them? (Open Answer)

Increase the speed of data throughput compared to 2014 (Note: Results of this questions will be shared with the BDV PPP DataBench project)

31. Does your initiative expect to improve data throughput? (YES/NO?)
32. If yes, what metrics are you using to monitoring this? (Open Answer)
33. If yes, what percentage improvement have you proved with your project? (Numerical Percentage Value).

Section 3: Experiments in Big Data (Contributes to II-11, II-12 and II-14)

Large Scale experiments conducted in cPPP projects and i-Spaces involving closed data

34. Number of large-scale experiments conducted in your project in 2017 (number)
35. How many of those involved closed data? (number)
36. Please describe your criteria for an experiment to qualify as “large-scale” (e.g. cross-border / Geographical impact, Number of companies involved, Investment, Higher TRLs, number of users, etc) (open question)

Uptake of BDV use cases and experiments

37. Number of data experiments/use cases of any kind or size conducted in 2017. (number)
38. Please provide some qualitative data to support your answer (i.e list, brief description,..) (open answer)
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Amount of data that has been made available for experimentation (cPPP projects and i-Spaces)

39. Number of Exabytes of data made available in your project in 2017 (including closed data)
   (This includes data made available for experimentation (e.g. Data incubators and i-Spaces) and data made available internally in the projects for experimentation purposes, so closed data (e.g. Lighthouses and other projects))

40. Please add some qualitative information to your answer (e.g. overview type of data, providers, etc)

Section 4: Contribution to Macro-Economics KPIs

(Contributes to II-1, II-2 and II-3)

41. Does your project contribute (has contributed or plan to contribute) to increase revenue share of EU companies against total of revenue of EU, US, Japan, Brazil? (YES/NO?)

42. If yes, please provide some qualitative statements about how your project is contributing to this. (Open Answer)

43. Does your project contribute (has contributed or plan to contribute) to increase the number of European Companies offering data technology, applications? (YES/NO?)

44. If yes, please provide some qualitative statements about how your project is contributing to this. (Open Answer)

45. Does your project contribute (has contributed or plan to contribute) to the revenue generated by European Data Companies? (YES/NO?)

46. If yes, please provide some qualitative statements about how your project is contributing to this. And examples of success stories (Open Answer)

Section 5: Contributions to environmental challenges

(Contributes to II-6, II-19, II-20, II-21)

Energy saved in big data analytics using a specified benchmark through solutions provided by specific cPPP projects compared to baseline at beginning of H2020

47. Are you monitoring Energy Efficiency in your project? (YES/NO?)

48. If, yes, what metrics are you collecting to assess this parameter? (Open Answer)

49. If yes, what percentage improvement have you proved with your project? (Numerical Percentage Value).
### Contribution to the reduction of energy use and CO2 emissions

50. Does your project contribute to the reduction of energy use? (YES/NO?)
51. If yes, please provide some qualitative and quantitative statements (2017 and planned)
52. Does your project contribute to the reduction of CO2 emission? (YES/NO?)
53. If yes, please provide some qualitative and quantitative statements (2017 and planned)

### Contribution to the reduction of waste

54. Does your project contribute to the reduction of waste? (YES/NO?)
55. If yes, please provide some qualitative and quantitative statements (2017 and planned)

### Contribution to the reduction in the use of material resources

56. Does your project contribute to the reduction of material resources? (YES/NO?)
57. If yes, please provide some qualitative and quantitative statements (2017 and planned)

### Section 6: Mobilisation of stakeholders, outreach, success stories

(Contributes to section 2.2 of the monitoring report of the contractual PPPs)

58. Number of dissemination events, seminars, conferences organised by your project in 2017 (number)
59. List and describe all the activities performed in 2017 to mobilise and outreach stakeholders in your project in 2017? (i.e. dissemination and communication activities of any kind, events, workshops, etc). Include in all cases the outreach in numbers of participants and in geographical outreach. (open question)
60. List your project main stakeholders (the ones you are addressing and need to outreach) and briefly indicate how did you address outreach to them during 2017.
61. List and describe success stories of your project during 2017 (open question)
Section 7: Contribution to Standards

62. Does your project perform any activities leading to data/Big data Standardisation? (yes/no?)

63. If yes, list and describe activities performed by your project during 2017 leading to standardisation

64. Does your project contribute (through one or several project partners) to European Standardization Bodies (ESBs) activities? (yes/no?)
   If yes,
   65. Indicate the number of Working Items in European Standardization Bodies (ESBs) that where your project is involved in and that are related to the topics of the PPP
   (A Working Item is a registered topic in one of the ESBs that has been accepted as a matter of standardization activities).
   66. List the IDs of the Working Items (list)
   67. Indicate the number of Pre-Normative Research Files under consultation in European Standardization Bodies (ESBs) that your project is involved in and that are related to the topics of the cPPP.
   (A Pre-Normative Research File is a draft standard under consultation in one of the ESBs.) (number)
   68. List the prEN numbers of these Research Files

Section 8: Contribution to Big Data Ecosystem

69. Does your project run or support a programme that is specifically targeted at supporting start-ups or entrepreneurs in the Big Data area? (yes/no?)
   If yes, please describe! (You will be contacted for further details, if necessary)

70. Is your project engaged in contributing to any National activities that are related to Big Data and Artificial Intelligence? yes/no?)
   If yes, provide the country, details of the activity, and an overview about your participation!
   Some short statements are sufficient. You will be contacted for further details separately.

71. Is your project present in EU13 Member States? (yes/no?)
   If yes, provide country(ies), and overview of activities in that country.

72. Is your project linked to another European PPP, ETP or European industrial Association? If yes, provide PPP/ETP and briefly describe common activities.
III. Annex 3 – Data for Infographic

This Annex contains data that had been used for the Infographic coming from the data in the Monitoring Report 2017. This data was retrieved from the different KPIs in MR2017 and grouped to the different areas of interest as indicated in chapter 3.

Investment

Different categories of investment are interesting here:

a) Public investment in the PPP (numbers from EC side): 158,8 M€ (invested up to now)

b) Investment from industrial side (numbers): 1,1B€ (since launch of PPP)
   1.) private expenditure in the PPP projects, 12,4 M€ (2017)
   2.) private investment in the context of the PPP but not related to PPP projects incl. follow-up investment after end of project 472,2 M€ (2017)

c) Leverage factor public vs. private investment: absolute calculated number based on investment data 6,95

d) Public investment through cascade funding (quantitative) no figures for 2017 as money from accelerator projects will be paid only in 2018 (call and selection done in 2017)

Jobs & Skills

For the Jobs & skills the main goal is to show (quantitative, some qualitative explanation):

a) Number of Jobs created (and related context explanation):
   1.) total number:
      estimation was done based on qualitative feedback from projects/companies;
      between 1.000 and +10.000 new jobs by 2023;
      50% of BDVA members stated that their participation in BDVA/BDV PPP contributed directly/indirectly to Job creation (over 1.000 jobs in 2017)
   2.) percentage of actors of the PPP involved,
      70% of projects and 50% of BDVA members said that will contribute to job creation by 2023

b) New Job profiles created:
   1.) total number: no new job profiles created in 2017
   2.) percentage of actors involved from the overall PPP:
      40% of projects and 43% of BDVA members contributed to creation of new Job profiles
   3.) examples of new job profiles

c) Skills created:
   1.) numbers of new skills created:
      remark in Monitoring Report: Not enough quantitative data has been provided to provide discrete number in relation to the skills creation
   2.) percentage of PPP partners involved:
      50% of projects and 70% of BDVA members contributed to creation of new skills linked to Big Data Value
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3.) numbers of training courses (number of participants involved):
from projects: 18 training courses with 1,700 participants

Innovation
The main innovation outcomes from the projects can be reported as follows:

f) Innovations of exploitable value (including technologies, services, software, products, tools, platforms, models and systems: for 2017 in total 45
From which “New Systems and Technologies” – overall: for 2017: 32

g) New services of high societal value: quantitative; for 2017: 1

h) Spin-off (from projects) and startups (from accelerator projects): quantitative

i) Patents: quantitative.
   For 2017: 3 patents

SMEs
Of particular interest are the following points showing the impact the BVP PPP is having on SMEs:

a) Number of SMEs participating in PPP projects or being member of BDVA:
   53 SMEs responded which is a rate of 57% of the total SMEs → means that the total number of SMEs involved both in projects and the association are 93

b) Types of SMEs:
   1.) size: 3 different sizes (result in percentage):
       11% medium sized, 47% small companies, 42% micro companies
   2.) age: 3 different timelines (result in percentage):
       32% (0 to 4 years), 25% (5–10 years), 43% (> 10 years old), average: 9,6 years
   3.) geographical distribution (could be shown in a map):
       Austria, Belgium, Cyprus, Denmark, Finland, France, Germany, Greece, Ireland, Italy, The Netherlands, Portugal, Romania, Slovenia, Spain, Switzerland and UK (countries from SMEs that responded to the questionnaire)

c) Turnover:
   1.) numbers for each year, for 2017: 175,8M€
   2.) percentage for evolution:
       69% with respect to 2014, 10,6% with respect to 2016

d) Number of Employees:
   1.) numbers for each year, for 2017: 1,645,2 FTEs
   2.) percentage for evolution over time: for 2017: increase of 51,91%

e) Public investment in SMEs:
   contribution went to SMEs for 2017: 22,5% of EC

Outreach
The potential outreach of the BDV PPP can be demonstrated on different levels:

a) Collaborations with other international initiatives (see Figure 1) including the work on the SRIA: qualitative description;
   for 2017: collaboration with ETP4HPC, ECSO, AIOTI, 5G, EOSC and EFFRA

b) Collaboration with national initiatives: quantitative (number of collaborations)
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c) Communication activities: quantitative (number of events).
   For 2017: 100 events
d) Members of BDVA: quantitative (number and percentage of increase),
   for 2017: almost 200 members

Experimentation
Here the aim is to report the number of all large-scale experiments as well as all use cases, with particular focus on the amount of data made available for the overall experimentation.

Data to be shown (quantitative):
a) Total number of large-scale experiments vs. number of experiments using private data:
   for 2017 in total 26 large-scale experiments, 19 of them involved private data
b) Total number of use cases vs. number of use cases using private data:
   for 2017: 151 use cases/experiments from projects + 130 data experiments from BDVA (mostly i-Spaces)
c) Number of Data made available:
   for 2017: 0,0854 Exabytes (85,4 Petabytes) - input only from 3 projects
d) Data throughput: percentage;
   for 2017: 30% of projects reported expectation of improving data throughput, one project already indicated improvement of 150-200% → ATTENTION: from 2018 DataBench will work with the projects on this

Success Stories
Success stories make the KPIs tangible.
They can be reported currently only at qualitative level by mentioning them (numbers to be collected in next iterations). Examples are:
   a) Development of new technologies
   b) Successful experiments
   c) New business opportunities
   d) New partnerships
   e) etc.

Environmental challenges
Stakeholders might expect that the usage of Big Data helps reducing the environmental impact for different categories. We should therefore report on
a) Reduction of CO\textsubscript{2} emissions (percentage):
   for 2017: 20% reduction in some pilots. DataBench project will work with the PPP projects on that starting from 2018
b) Reduction in waste (percentage):
   for 2017: up to 10% reduction in waste
c) Reduction of Energy use (percentage):
   for 2017: improvement in efficiency range between 12% and 40% (KPI II.19)
d) Reduction in use of material resources:
   for 2017: no quantitative statements possible (not enough data)

The percentage would be based on the projects working in this aspect. For MR2017 the two Lighthouse Projects, Transforming Transport and Data Bio contributed to the numbers.
IV. Annex 4 – Content for Infographic collected from MR 2017

The following table is a categorization of the contents that will be visualized by the Infographic divided by:

- **Area of interest**, related to the topics that are already addressed in the Monitoring Report;
- Quantitative **content/achievement** to be shown in a graphical way;
- **Text**, when needed, describing or identifying the content;
- **Key Message** providing the introduction for each Area of Interest, giving the stakeholders a general overview of the Impact achieved.

<table>
<thead>
<tr>
<th>Area of Interest</th>
<th>Content</th>
<th>Text</th>
<th>Key Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>General</td>
<td>45 new Innovations of exploitable value;</td>
<td></td>
<td>Big Data Value cPPP, a partnership between the European Commission and the Big Data Value Association (BDVA), plays a central role in the implementation of a Data Market and Data Economy in Europe, developing an interoperable data-driven ecosystem as a source of new business and innovations using Big Data.</td>
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<tr>
<td></td>
<td>3 patents, over 23 scientific publications and 7 new products or software in the field of advanced privacy and security for data access, processing and analysis;</td>
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<td></td>
<td>25 Large Scale experiments and over 150 use cases and experiments;</td>
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<td></td>
<td>85,4 Petabytes of data (closed data and open data) for experimentation;</td>
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<td></td>
<td>70% of the PPP projects contribute to job creation with an estimation from 1000 to +10000 new jobs by 2023.</td>
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<td></td>
<td>&gt;10% reduction of energy use</td>
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<td></td>
<td>20% CO₂ emission saving</td>
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<td></td>
<td>Up to 10% reduction in waste</td>
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<tr>
<td>SMEs</td>
<td>Total turnover for the SMEs participating in the cPPP projects is increased</td>
<td></td>
<td>A wide range of SMEs in Europe, independent of</td>
</tr>
<tr>
<td></td>
<td>Total turnover for the SMEs participating in the cPPP projects is increased</td>
<td>More than 50 SMEs</td>
<td></td>
</tr>
</tbody>
</table>
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<table>
<thead>
<tr>
<th></th>
<th>in 2017 by 69% with respect to 2014 and by 10% compared with 2016</th>
<th>participating in cPPP projects</th>
<th>size, age or geography, benefits from the Big Data Value cPPP: the results are an Increase in Turnover, and an increase in number of employees.</th>
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<tbody>
<tr>
<td></td>
<td>The estimated increase in number of employees for SMEs participating in the cPPP projects is about 183% in 2017 with respect to 2014 and about 52% if compared with 2016</td>
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<td></td>
<td>11% medium-size companies</td>
<td>SMEs size</td>
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<td>47% small companies</td>
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<td>42% micro companies</td>
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<td></td>
<td>32% of SMEs are 0 to 4 years old</td>
<td>SMEs age</td>
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<td></td>
<td>25% of the SMEs are 5 to 10 years old</td>
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<td></td>
<td>43% of the SMEs are 10 years old or older</td>
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<tr>
<td><strong>Outreach &amp; Success Stories</strong></td>
<td>#44 in Data Management #119 in Data Processing Architecture #120 in Data Analytics #67 in Data Protection #81 in Data Visualization and User Interaction</td>
<td>Technical contributions for Big Data Priorities in SRIA</td>
<td>cPPP implementation brings a first wave of success stories whose outcomes cover 67% of all the Strategic Research Innovation Agenda technical priorities.</td>
</tr>
<tr>
<td><strong>Transforming Transport</strong></td>
<td>(11)</td>
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<td>EW Shopp (6)</td>
<td>45 new innovations or new technologies of exploitable value</td>
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<td>SODA (2)</td>
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<td>euBusiness Graph (13)</td>
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<td>SLIPO (6)</td>
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<td>Big Data Ocean (2)</td>
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<td>Fashion Brain (3)</td>
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<td>Data Bio (1)</td>
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<td>KPLEX (1)</td>
<td></td>
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<tr>
<td></td>
<td>#3 patents in 2017 # 24 planned 2018+ #23 publications in 2017 # 44 publications planned 2018+</td>
<td>Number of patents or publication filed by cPPP projects that enable or</td>
<td></td>
</tr>
</tbody>
</table>
### D2.13: Online Impact Monitor

<table>
<thead>
<tr>
<th>#7 products/SW components enabling advanced privacy and security in 2017 #17 new products/SW planned 2018+</th>
<th>describe advanced privacy and security solutions</th>
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<tbody>
<tr>
<td><strong>BDVA impact</strong></td>
<td></td>
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<tr>
<td>43% of BDVA members have contributed to the creation of new Job Profiles</td>
<td>skills</td>
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<tr>
<td>22.5% of BDVA members supports with specific programs entrepreneurs or start-ups in the Big Data (innovation labs, incubator, Business development Support)</td>
<td>Development of Data Companies in EU</td>
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<tr>
<td>26% of BDVA members performs activities leading to BIG DATA standardization</td>
<td>Contribution to standardization bodies</td>
</tr>
<tr>
<td>The number of BDVA members is increased by 25% in 2017</td>
<td>participation</td>
</tr>
<tr>
<td>33% of BDVA members are SMEs</td>
<td>SMEs involvement</td>
</tr>
<tr>
<td>7 labelled i-Spaces provides Data Experimentation and Data Incubation capabilities for SMEs</td>
<td>Large scale experiments</td>
</tr>
</tbody>
</table>