



Raising Open and User-friendly Transparency- Enabling Technologies for Public Administrations



Project number 645860
H2020-INSO-2014

D3.2: Interactive Activities in Open Data Use



WISE&MUNRO



Document produced by

Organisation: CNRS Paris

Author / email: {michael.baker, francoise.detienne, jonathan.groff}@telecom-paristech.fr

Subject: Research Report

Due date: Month 24 (31 January 2017)

Dissemination level: Public

Reviewed and approved by

Date	Name	Organization
24/01/2017	Ilias Trochidis	Ortelio
24/01/2017	Jerry Andriessen	Wise & Munro Learning Research

Revision History

Version	Date	Authors	Status	Description of Changes
1.0	11/04/2016	Baker, Détienne, Groff	draft	Definition of deliverable structure
2.0	20/11/2016	Ruijter	draft	Integration of U. Utrecht contribution, extension of y1 societal model
3.0	01/12/2016	Hogan, Andriessen, Ruijter	draft	Integration of dialogue game analysis contributions from Partners Utrecht, Galway, Wise & Munro
4.0	05/12/2016	Hogan, Ojo	draft	Integration of U. Galway contribution, usability evaluation method
5.0	06/01/2017	Baker, Détienne, Groff	draft	Integrated evaluation section completed
6.0	17/01/2017	Baker, Détienne, Groff	draft	Integration of comments from partners at Salerno meeting (January 2017)
7.0	17/01/2017	Baker, Détienne, Groff	draft	Integration of new sections on societal model and literature survey, from Utrecht University Partner
8.0	19/01/2017	Baker	draft	Overall correction; changes to integrated framework section
9.0	25/01/2017	Andriessen, Baker	draft	Integration of internal review remarks
10.0	25/01/2017	Trochidis, Baker	draft	Integration of internal review remarks
11.0	25/01/2017	Baker	Final as submitted	Formatting, structure changes, towards final version
12.0	30/05/2017	CNRS: Baker, Détienne, Groff	Final revised	Responses to reviewers' remarks (end of Y2 review), notably: (1) an extra section (§5.3) to summarise results of application of dialogue game analysis method to partners' SPOD-TET interaction corpora, (2) extra subsections in concluding section, for lessons learned and implications for further work. Additional modifications throughout, including cross-referencing to D5.2.

EXECUTIVE SUMMARY

This document describes work carried out during the second year of the ROUTE-TO-PA project, within Workpackage 3, “Models and Methods”. The principal task active during this year was T3.2, “Community participation and interaction models” (M13-24).

(1) In terms of this task (T3.2), the main body of this document presents **a model for analysing patterns of participation and interaction in online epistemic communities supported by the SPOD-TET tools**, based on an integration of the **theory of Joint Projects** (Clark, 1996, 1999) and the **theory of Dialogue Games** (Wittgenstein, 1978; Levin & Moore, 1983). Joint Projects represent the meso-level structures of community participants’ tasks involving use of open data visualisations (framing their problem, identification of relevant data, interpretation of the visualisations, and production of problem solutions based on the latter). In order to achieve these (sub-)tasks, participants engage in particular sets of dialogue games, in order to regulate the activities (who will do what, how and when?), exchange relevant information (request, provide), evaluate the degree of achievement of tasks (is this correct, satisfactory, ... ?) and co-construct ideas based on the open data visualisations. **Interactive emergent roles** (e.g. ‘leader’, initiator, helper, info-provider, collaborator, opponent, ...) are defining elements of dialogue games. On the basis of dialogue games described in the research literature, an empirically-grounded set of such structures has been elaborated and applied to analysis of SPOD-TET interaction data across the partners’ platforms. With respect to the dialogue game model, the full evidence base for **this deliverable (D3.2) can be found in D5.2**, since the latter reports full results of application of the model to project participants’ SPOD-TET interaction corpora. Full corpora are reproduced in the Appendix of D5.2(c). In order to give a complete picture for readers of this document (D3.2) of the development and application cycle of the analysis model, a short synthesis of the D5.2 results is presented in the present deliverable (§5.3).

(2) Within this second year, the year 1 societal model was also further developed in order to provide operational definitions of transparency according to different types of democracy, that enable integration with the year 2 “Community model” and evaluation of the degree of effective transparency of SPOD-TET interactions.

(3) A Technology Usability Model, method and associated questionnaire (see Appendix 3) were developed for evaluating usability, i.e. the extent to which the SPOD-TET tools enable users to achieve their goals (the objects of their activity, their Joint Projects).

(4) The models/methods described above were integrated into **a common evaluation approach**, defined in close relation to the project’s goals. Responses to evaluation questions, derived from this approach, are reported in D5.2, in relation to systematic analyses of partners’ SPOD-TET interaction data.

In summary, at the end of the second year of the project, an integrated analysis and evaluation method has been defined, in close relation to the work of Workpackage 5. This prefigures work in Workpackage 3 during the third and final year of the project, focussed on the individual in SPOD-TET mediated online communities, with respect to perception of effective transparency and engagement.

TABLE OF CONTENTS

1	Introduction	6
1.1	General background.....	6
1.2	Work carried out in WP3 during Year 2 and responses to end of Y1 review recommendations 7	
1.2.1	Work carried out in WP3 during year 2	7
1.2.2	Responses to reviewers' recommendations.....	8
2	Extensions of the year 1 Societal Model during year 2: forms of democracy and transparency	8
2.1	The role of transparency.....	9
2.2	Three democratic processes and co-creation	10
2.3	Developing Criteria for the Societal/Organizational level.....	12
3	Model for analysing Interactive Activities in Open Data Use: Joint Projects and Dialogue Games	15
3.1	Background: analysing online communities	15
3.2	Theoretical foundations: Joint Projects and Dialogue Games	17
3.2.1	Joint Projects	17
3.2.2	Dialogue Games.....	20
3.3	Development of the community-level analysis method.....	28
3.4	Example analyses of SPOD-TET interactions from ROUTE-TO-PA partners' corpora	30
3.4.1	Wise and Munro (Partner 3): Example SPOD-TET analysis.....	30
3.4.2	University of Utrecht (UU, Partner 6): Example SPOD-TET analysis	33
3.4.3	National University of iRELAND at Galway (Partner 4): Example SPOD-TET analysis.....	38
3.4.4	CNRS Paris (Partner 2): Example SPOD-TET analysis	43
3.5	Summary: community level model and analysis method.....	46
4	Usability, Technology and User Level Evaluation: Approach and Evaluation tool.....	47
4.1	Usability Evaluation	48
4.2	Technology-level Evaluation	49
4.3	User-level Evaluation	50
5	Integrated analysis and evaluation model	51
5.1	Model integration	51
5.2	Project goals, Evaluation questions and methodological tools	54
5.3	Synthesis of results of the application of the community level analysis method to full year 2 corpora.....	57
5.3.1	Overview.....	57
5.3.2	Evaluation Question 1: Open Data (visualisation) focus.....	58
5.3.3	Evaluation Question 2: Online Epistemic Communities (goal achievement)	59
5.3.4	Evaluation Question 3: Transparency	60
5.3.5	Evaluation Question 4: Online Epistemic Communities (community evolution).	61
6	Conclusions, Lessons Learned and Implications for Further Work.....	61
6.1	Concluding reflexions.....	61
6.2	Lessons learned and implications for further work	62
7	Bibliography	63

8	APPENDICES	66
8.1	Appendix 1: Dialogue Game Analysis tables.....	66
8.2	Appendix 2: Usability questionnaire.....	69
8.3	Appendix 3: Draft criteria formulated by pilots aug/sept 2016.....	73
8.4	Appendix 4: Guidelines for analyzing online interactions on the SPOD	76

1 INTRODUCTION

1.1 GENERAL BACKGROUND

The purpose of this deliverable is to present work carried out within Workpackage 3 (“Models and Methods”) during the second year (M13-M24) of the ROUTE-TO-PA project.

We recall that the overall goal of the ROUTE-TO-PA project is to enable citizens to establish a more effectively transparent relation with their Public Administrations, on the basis of the meanings that individuals, groups or communities (co-)construct with respect to open data. For this, specific technological tools have been developed, for creating visualisations of open data (“TET”) and for integrating these into a specifically designed and implemented social network (“SPOD”). When used together, SPOD and TET enable citizen-users, with their public administrations, to discuss open data visualisations, better understand them and thereby change their representations of the degree of effective transparency of Public Administrations.

The aim of Workpackage 3 is therefore to provide the theoretical and methodological bases that will enable researchers to understand **the nature of participation, by citizens and Public Administrations, in the use of the SPOD-TET tools**. This is necessary for shaping ongoing (re-)design of the tools (WP4), for designing scenarios of usage of the tools (WP2) and for evaluating usage of tools in terms of success criteria (WP5).

Crucially, the WP3 models should enable understanding of **how online communities emerge, function and grow**, which are focussed on co-construction of meanings of open data (i.e. epistemic communities), and involve development of a more effectively transparent citizen-Public Administration relation, as facilitated by the SPOD-TET tools.

Across the 3 years of the project, work in WP3 (according to the Description of Work) is organised into 3 types of models:

- 1) Societal Model (Year 1). Based on Activity Theory (see D3.1), the main goals, community rules and social characteristics of groups of potential users and Public Administrations are identified, with respect to scenarios of usage. “Tensions” and their possible means of resolution, between activity systems have been identified (Task 3.1).
- 2) Community participation and interaction models¹ (Year 2). This is a model of forms of participation and joint action within online epistemic communities, on and around open data visualisations, mediated by the SPOD-TET tools (Task 3.2). The main theoretical bases are the theory of Joint Projects (Clark, 1996, 1999) and the Theory of Dialogue Games (Wittgenstein, 1978; Power, 1979; Levin & Moore, 1983).
- 3) Change in social representations and use-case related understanding (Year 3). The focus here is on individuals, users of SPOD-TET, in online communities, the changes in their degrees of engagement and their representations of the degree of transparency of their interactions in online communities.

The division of WP3 into the development of these three types of models, over the three years of the project is appropriate since:

- (i) In year 1, the main issue was to identify and understand social groups of potential citizen users and Public Administrations, for which the **Societal Model** is most relevant; the **main data analysed** are **focus-group interactions and interviews**.
- (ii) In year 2, the main issue is to stimulate the emergence of online communities, and to study their characteristics (**Community Model**); the **main data analysed** are **computer-mediated interactions** (exchanged messages, embeddings of open data visualisations, other interface actions)

¹ In the rest of this document, “Community participation and interaction model” will be abbreviated to “Community Model”.

- (iii) In year 3, as online communities are in place and developing, the focus can now be on changes in individual users' representations (of transparency), of their engagement and of the SPOD-TET tools themselves (usability work is, however, carried out from the beginning of the project to its end), within developing online communities. The **main data to be analysed** are **computer-mediated interactions** (focussing evolving individuals' roles within communities) and **questionnaire responses**.

To these three models, we have added, in this year (the second) work on elaborating a **Model of Technology Usability** (see **section 4** of this document), in order to specifically consider the role of technology, with respect to the other models

Two further important points need to be noted:

- Firstly, as discussed below, **these** separate **models**, focussing on societal, community, individual and technology 'levels' (or viewpoints on the same basic phenomena), **have been integrated** (see **§5 below**), in terms of multiple relations (e.g. between forms of democracy at the societal level and types of dialogue games at the community level). We have been able to identify points of correspondence between models, in operational terms and to elaborate visions of key concepts of **transparency** and **engagement**, according to these models. As described below, these unifying concepts enable 'vertical' integration of models, in conceptual terms.
- Secondly, the models developed in Workpackage 3 are **descriptive**: they describe human individual and joint action, as mediated by technology, in terms of specific categories of action and other theoretical constructs. During this year we have made progress in establishing correspondences between the descriptive models and **normative models**, i.e. what counts as preferred types of (joint) action in communities on SPOD-TET (see **§5 below**). This relates closely to success criteria as defined by Public Administration partners in ROUTE-TO-PA, as presented in WP5 deliverables (see Appendix 3 of the present D3.2 document).

1.2 WORK CARRIED OUT IN WP3 DURING YEAR 2 AND RESPONSES TO END OF Y1 REVIEW RECOMMENDATIONS

1.2.1 WORK CARRIED OUT IN WP3 DURING YEAR 2

The single active task in WP3 during year 2 is: Task 3.2 Community participation and interaction models (M13-M24). This corresponds, therefore, to the main work carried out during this year, and involved the elaboration of a method for analysing SPOD-TET interactions using theory of Joint Projects and Dialogue Games. In addition, the year 1 societal model was further developed, in relation to success criteria, and progress was made in anticipation of year 3 work, on the "individual representations" model, in terms of developing an evaluation tool (questionnaire). More generally, closer connexions between WP3 descriptive work and WP5 evaluation criteria were made.

In summary, therefore, the main work carried out in Workpackage 3 during the second year of the project is as follows:

- I. **Development of the Community Model**, for analysing (Task 3.2) online communities, based on theory of Joint Projects and Dialogue games.
- II. **Extension of the Societal Model** (task 3.1, D3.1), in order to integrate it with the Community Model involving definition of (normative) success criteria, transparency and forms of democracy.
- III. **Development of a Technology Usability Model**, giving rise to a questionnaire evaluation tool.
- IV. **Elaboration of an integrated approach to evaluation**, on a conceptual/model level and in terms of transposing the descriptive (what is the nature of users' collective mediated activity?) to the prescriptive (what types of activities are preferred, as indicators of success in terms of project goals?).

It is important to note that point 1. *Development of the Community Model* is the only active task in year 2 of the project, in line with the Description of Work. Therefore, this deliverable focuses on that task – the community level model, its attendant analysis method, and its application. The societal model and the individual/technology level models have been further advanced during this second year, but their application to data during year 2 is not reported here: this work will feed into Task 3.3, the individual model, during year 3 of the project (an integrated questionnaire, involving all three types of models).

With respect to **the structure of this deliverable**:

- **Section 2** presents achievement 1 (further development of the societal model)
- **Section 3** presents the main work of year 2 in Workpackage 3 (task 3.2), i.e. the community model
- **Section 4** presents the Technology Usability Model
- **Section 5** presents the integration of models, with their transposition towards an evaluation approach, the results of whose application to SPOD-TET dialogue corpora are synthesised (see D5.2 for full evidence-base, i.e. coded interaction corpora).

Appendices reproduce: (1) Dialogue game analysis tables, relating to section 3; (2) the usability questionnaire, relating to section 4; (3) success criteria formulated by Public Administration partners; and (4) Guidelines for dialogue game analysis relating to section 3.

This deliverable (D3.2) is related to D5.2, that presents full results of the application of the Community Model analysis method (Joint Projects and Dialogue Games) to partners' corpora of SPOD-TET interactions, in order to evaluate them with respect to success criteria. In order to make the present document, D3.2 more readable and complete, a synthesis of results of applying the dialogue game analysis model to partners' corpora is provided here in section 5.3.

1.2.2 RESPONSES TO REVIEWERS' RECOMMENDATIONS

The two reviewers' recommendations concerning future work in the end of Year 1 review report, directly relating to WP3, are as follows:

- **R1**: *"The knowledge co-creation process should be better designed, captured and embedded in the different activities and the implications/benefits for the desired results should be made more explicitly evident."*
- **R2**: *"The 4-levels of evaluation should be integrated in a systematic framework to account for sustainability and added value of the project's outputs".*

With respect to **R1**, the Dialogue Game model (Task 3.2) specifically addresses the co-creation process on SPOD-TET. The work we have carried out (see §4 below) on identifying, on the basis of the descriptive analyses of online community interactions, preferred types of interactions in relation to success criteria address in part the benefits and desired results.

With respect to **R2**, sections 3 and 4 below present the current state of integration of the analysis-evaluation models and methods into a systematic framework.

2 EXTENSIONS OF THE YEAR 1 SOCIETAL MODEL DURING YEAR 2: FORMS OF DEMOCRACY AND TRANSPARENCY

During year 2 of the ROUTE-TO-PA project, the Societal Model of open data use (developed during year 1 of the project in WP3, Task 3.1, D3.1) was further developed with a view to integrating this model with the year 2 community-level model, with respect to the following aspects:

- 1) defining how the concept of **transparency** relates to actions on the level of organisation (PA) and SPOD-TET communities;

- 2) defining how the community actions and associated success criteria relate to **types of democracy**;
- 3) defining indicators for **assessing 'external' impact** on the levels of **PA organisations, government and society**.

The definition of **indicators** of impact was based on:

- a) Three democratic processes developed in the societal activity model, together with a systematic literature review,
- b) an assessment of the criteria formulated by the pilots, in collaboration with researchers, during the ROUTE-TO-PA Prato meeting in September 2016 (see **Appendix 3**). The participants were asked to formulate questions based on their scenario.

2.1 THE ROLE OF TRANSPARENCY

ROUTE-TO-PA aims to encourage **the transformation from nominal to effective transparency**, via user/community **engagement** in an open-data platform (TET and SPOD). In section 5 of this deliverable, we describe how the key concepts of **transparency** and **engagement** enable 'vertical' integration of models of user activity.

For transparency to be effective (see Figure 1) there must be citizens capable of processing, digesting and using open data (Heald, 2006). The assumption is that Individual users transform raw open data into knowledge in interaction with others on the open data platform. The knowledge created can be used for insights, informed interaction or informed collaborations regarding a scenario/public problem (or object), leading to ideas and solutions for the scenario. This outcome may then again lead to the disclosure of more datasets (nominal transparency). Users again in interaction with others may transform this new data into meaningful knowledge regarding a scenario. In addition, at the start of the ROUTE-TO-PA project we identified several tensions in each pilot project (see Deliverable 3.1). Some of these tensions referred to e.g. a lack of support or a lack of resources: we call these the preconditions for effective transparency.

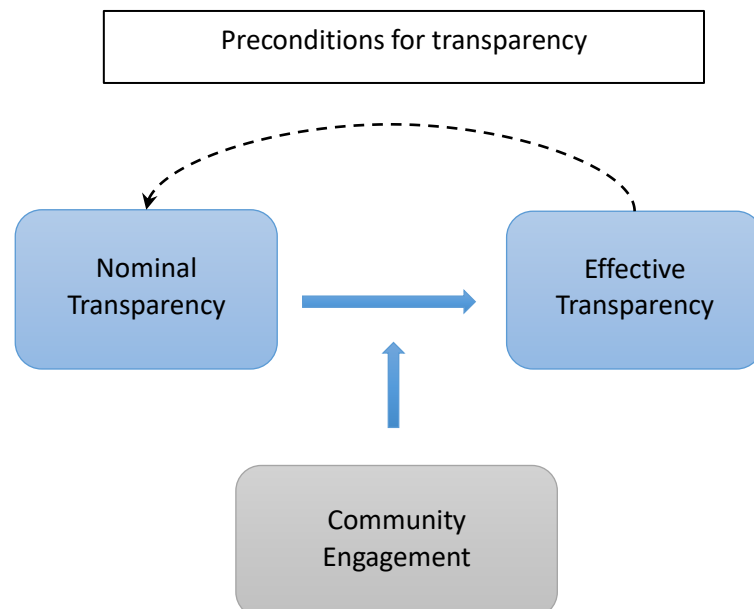


Figure 1. Nominal and effective transparency in relation to community engagement

The Societal Activity Model developed in deliverable 3.1 allows us to identify the components that influence the process described above, from nominal to effective transparency. It also allowed is to

identify tensions or challenges for each case at the start of the project. The Societal activity model takes into account the context in which open data usage takes place.

Building upon the Societal Activity Model in Deliverable 5.1 the following views on transparency were distinguished:

a) Technological transparency. This view highlights that transparency is created when information is available to be used. In the literature this is sometimes referred to as nominal transparency (Heald, 2006, p. 34). This nominal transparency is generally assessed in terms of number of documents and datasets that are made available on the open data platform.

b) User transparency. This view highlights that there must be receptors capable of processing, digesting and using the information/open data. Heald (2006: 35) refers to this type of transparency as effective transparency. Effective transparency is assessed in terms of the accessibility, understandability and usefulness of the information/ open data to users.

c) Community transparency. This view stresses that transparency is about social information: the meaning that is attributed to information in social processes. Transparency is constructed socially by group interactions and learning. Community transparency can be assessed in terms of the 'closure' (or outcome) that takes place within a group concerning the meaning of certain information.

d) Institutional transparency. This view stresses that transparency is generated if more openness about performance, processes, roles, tasks, responsibilities of government have been created. Transparency acquires an institutional meaning when it influences interactions in the public domain. Societal transparency is assessed in terms of the institutional openness that is generated by interactions in the public domain.

We focus here on the societal level or institutional transparency

2.2 THREE DEMOCRATIC PROCESSES AND CO-CREATION

At the start of the project the societal activity model had a solely democratic focus. After all, one important underlying condition of a properly functioning democracy is access to information (Harrison & Sayogo, 2014). Informed citizens are better able to contribute to democratic processes, better able to understand and accept the basis of decisions affecting them and better able to shape the situations in which they live (Birkinshaw, 2006; Meijer, Curtin, & Hillebrandt, 2012). Several scholars have pointed out that open data platforms aim to foster democratic processes by promoting transparency through the publication of government datasets and by providing the opportunity to actively participate in government processes such as decision-making, policy-making and solving public problems (Verhulst & Young, 2016, Attard, Orlandi, Scerri, & Auer, 2015; Lourenço 2015; Dawes & Helbig, 2010; Janssen, 2011). Therefore initially the Societal Activity Model was developed in light of three democratic processes: monitorial, deliberative and participatory. However, open data platforms may also aim to stimulate innovation, economic growth and at improving service delivery (Verhulst & Young, 2016; Janssen, Charalabidis, & Zuiderwijk, 2012; Huijboom & Van den Broek, 2011).

However after analyzing the goals and objectives of the pilots (see **Appendix 3**) and discussions with the pilots during ROUTE-TO-PA sessions, we observed that some of the pilots also have elements of what is called in the literature as "co-creation". Co-creation is the active flow and exchange of ideas, information, components and products across society (academia, government, business, civil society and citizens) which allows for a better understanding of participation, engagement and empowerment, in policy development, creating and improving services and tackling systemic change" (Millard, 2015, p. 5). Not all co-creation however is aimed at improving democratic processes. Co-creation encompasses co-innovation and co-production of products, services and content (Millard, 2015). We have therefore added these processes to the Societal Activity Model. These processes are summarized in Table 1:

Table 1. Different forms of societal impact

Use of open data	Monitorial democracy	Deliberative democracy	Participatory democracy	Co-creation
	Monitoring government behaviour	Feeding public debates	Enabling collective action	Co-creation of new services
Object	Government behaviour or performance	Societal issue	Collective action	Innovation, new services
Technology (a)	- TET ensures transparency by access to data, data search and tools to visualize the data - SPOD facilitates data sharing	- TET ensures access and enables data analysis, personalization, comparing and combining datasets and feedback options - SPOD facilitates participation with debate and feedback options	- TET ensures access, decision making tools, the ability to add data - SPOD, facilitates collaboration with government and other stakeholders e.g. working together in documents	TET ensures access, decision making tools, the ability to add data - SPOD, facilitates collaboration with government and other stakeholders e.g. working together in documents
User (Citizen) (b)	Watchdog	Partner in dialogue	Partner in Action	Consumer, Innovator
Community (c)	Government, journalists	Government and citizens	Government, citizens, businesses, researchers	Government and Businesses, Employers, consumers
Rules/Mechanism	Checks and balances, e.g. privacy laws, but also rules regarding the virtual community	Open communication e.g. procedures regarding participation	Coproduction e.g. procedures regarding who is invited and who is represented?	Co-creation between government and business
Role <i>e.g. government</i>	Provider of information	Facilitating dialogue	Partner in Action	Facilitating innovation
Outcome (d)	Effective transparency contributes to insight in government behaviour	Effective transparency contributes to public debate	Effective transparency contributes to (collective) action	Effective transparency facilitates co-creation between various actors

In deliverable 5.1 we had initially formulated three questions for evaluation but based on our findings we have now added a fourth question:

1. Monitorial: Did the route-to-pa project lead to insight in government performance/better checks and balances?
2. Deliberative: Did the route-to-pa project contribute to public debates?
3. Participatory: Did the route-to-pa project contribute to new forms of collective action?
4. Co-creation: Did the route-to-pa project facilitate co-creation?

2.3 DEVELOPING CRITERIA FOR THE SOCIETAL/ORGANIZATIONAL LEVEL

The next step was to analyse which indicators and measures are used by scholars regarding the impact of open data at the societal level related to the four questions asked. Therefore, a systematic literature review was conducted. A systematic literature review helps in providing an overview of the current state of knowledge in an area, and any inconsistencies within it, while also clarifying what remains to be known (Petticrew & Roberts, 2006). We used the PRISMA-method, Preferred Reporting Items for Systematic reviews and Meta-Analyses (Liberati, et al., 2009). In total more than 300 articles were assessed and finally 46 articles were included in the literature review.

First we need to further define the societal level. Building on the literature review, we can identify two key components of an outcome: 1) the effectiveness of the outcome and 2) whether the outcome exerts an impact on government or the public domain (Nam, 2011). Furthermore, Worthy (2015) makes a distinction between direct and indirect effects of open data. The direct effects refer to professionalization of the system, improved information flows and a greater understanding internally of previously complex budget processes. The indirect effects refer to effects that involve network and feedback effects of attention and decay regarding open data.

Translating these concepts to ROUTE-TO-PA, the outcome may on the one hand refer to the direct outcome of a Challenge/Data Expedition/Hackathon (object 2a/2b in the societal activity model) consisting of one or several joint projects. This is the outcome of the community level; where citizen, business and PA users interact on the ROUTE-To-PA platform over open data regarding a scenario or joint project. The outcome of a Challenge/Data Expedition/Hackathon can be a physical product such as a report created by the community in the co-creation room, that reflects insights, ideas and solutions based on open data usage regarding a scenario (policy problem or innovation). The outcome can also refer to feedback generated by informed interaction within the community in the Agora (the public discussion space). The feedback can consist of e.g. an insight in, ideas/solutions based on debate for a policy problem or business opportunity or a suggestion for joined action. To evaluate effectiveness of these outcomes it should be examined here to what extent the outcome is aligned to its intended purpose (Nam, 2011). Each pilot has developed a scenario. For each scenario a goal was formulated. At the community level it is evaluate to what extent the outcome of the Challenge/Data Expedition/Hackathon contributed to the intended goal. At the societal level we take this as our starting point.

At the societal level it is measured whether the outcome generated by the community also has direct or indirect impact on government and/or the public domain (object 3ab in the societal activity model). In Deliverable 5.1 we suggested to measure both the perceived and a general impact. The general impact we defined in terms of references to the community in media reports, policy plans, council minutes and other virtual communities. However, the literature review shows the difficulty of measuring indirect effects. Furthermore based on the current progress made by the pilots, the number of community participants involved and the insights gained regarding working with data in the different pilots, we suggest to measure the direct impact and where possible the indirect impact.

Direct impact refers to the process of developing an outcome by a community based on open data over time. This process consists of the preparation of (multiple) Challenge/Hackathon/Data expedition, the actual Challenge/Hackathon/Data expedition and their outcomes. This is in line with the steps identified in Deliverable 5.1: a) Developing or finding an issue or scenario and defining the information needs of the participants of the community (citizens, businesses, pa's), b) finding relevant open data for the scenario, 3) visualizing the data, 4) sharing the data and 5) discussing data and 6) outcome. The process often consists of both online interactions on the platform but also several off line meetings to discuss the scenario, find the data and to prepare users for the interactions. At the societal level we can evaluate what perceived impact the process has on a) government (Impact organization) or b) on the (citizen) community (community impact). We analyze whether any transformation can be detected over time. In terms of the indirect impact we analyze what happens with the outcome or the discussions? Or as Nam (2011) puts it whether the

contributed insights, ideas and solutions generated based on open data are actually considered or used as input into practice by government and or the public domain. Now that we have defined the Societal/Organizational level, the next step is to develop indicators for evaluating the societal/organizational level based on our definition of outcome.

The following indicators were developed based on the results of the literature review, and an assessment of the criteria formulated by the pilots during the ROUTE-TO-PA Prato meeting in September 2016 (Appendix 3). This resulted in the following Table 2:

Table 2. Operationalization of societal-level indicators in terms of forms of democracy

Societal level	Monitorial Processes	Deliberative Processes	Participatory Processes	Co-creation
<i>Direct Impact Community</i>	Critical view: Degree to which open data usage by the community contributed to informed (factual) and accountable analyses of operations and decisions of government	Informed debate: Degree to which open data usage by the community contributed to informed discussion between the government organization and diverse and representative public domain as perceived by the community regarding decision making, or the policy process	Informed participation: Degree to which open data usage by the community of government and citizens contributed joint collaboration regarding a policy issue or idea solution	Informed co-creation: Degree to which open data usage by the community contributed to informed co-production and co-innovation of products or services between government and businesses
<i>Direct Impact organization</i>	Degree to which the process of open data usage regarding a policy problem contributed to a change in the cultural and structural characteristics of the organization: roles, degree of support of different layers of government, available resources, burdensome or facilitating rules, procedures or open data policies, improved flows of information, tensions identified at the start of the ROUTE-TO-PA process.			
<i>Indirect impact</i>	Contribution to accountability: Degree to which the outcome was used as input for policies, rules, procedures within the government administration.	Contribution to decision making: Degree to which informed feedback was used as input for meetings, policy documents or decisions (agenda setting)	Contribution to collective action: Degree to which the outcome contributed to collective action by the government or by the community regarding a policy issue	Contribution to innovation Degree to which the outcome contributed to innovative services

Based on the indicators, semi-structured questions were developed that can be used by the pilots. Semi-structured questions allow for systematic general comparison across the pilot sites but also leave room for context-specificity. For instance, if a pilot focuses solely on democratic processes than the questions regarding co-creation might not be relevant. The questions were developed based on the literature review and a session with pilots and researchers during the Prato Consortium meeting in September 2016. Following the questions were tested in December in the Groningen Pilot. Interviews were conducted with two public administrators, one open data expert and one policy expert and with two representatives of citizens' initiatives in Groningen. Based on the interviews some questions were altered.

Table 3. Overview of questions for the societal/organizational level

	Monitorial	Deliberative	Participatory	Co-creation
<i>Direct impact community</i>	(1) To what extent did the ROUTE-TO-PA project lead to informed analyses regarding - Government processes - performance of government	(2) To what extent did the ROUTE-TO-PA project lead to Informed discussion between government and the community regarding the policy problem?	(3) To what extent has the ROUTE-TO-PA project contributed to more informed collaboration between government and the community in the policy process? (Based on survey Kim and Lee, 2012)	(4) To what extent has the ROUTE-TO-PA project contributed to informed co-creation of products, services or content
<i>Direct Impact Organization (only asked to pa's)</i>	(5) To what extent did the ROUTE-To-PA project lead to changes within or influenced the organization? Such as: - The degree of support by politicians? - The degree of support by managers? - Available resources (budget, personnel)? - Formal or informal rules or procedures within the organization? Such as open data policies - Other changes? (Based on Yavuz & Welch, 2014)			
<i>Outcome</i>	(6) What did you aim to achieve during the Route-To-PA project around <public problem>? (7) Was this aim achieved? (8) To what extent did the ROUTE-TO-PA project enhance government transparency?			
	(9) To what extent did the ROUTE-TO-PA project contribute to a better understanding of the public problem? (10) Could you provide an example	(11) To what extent did the ROUTE-TO-PA project contribute to new ideas and solutions for the policy problem? (12) Could you provide an example?	(13) To what extent has the ROUTE-TO-PA project been a joined action between government and the community? (14) Could you provide an example?	(15) To what extent has the ROUTE-To-PA project been a partnership between government and businesses
<i>Indirect Impact</i>	(16) To what extent did the insights from the ROUTE-TO-PA project (s) feed into decision making or the implementation of policies and programs? (Based on survey Kim & Lee, 2012)	(17) To what extent did the proposal (s) from the ROUTE-TO-PA project based on open data shape decision-making or implementing policies and programs? (Based on survey Kim and Lee, 2012)	(18) To what extent did the joined action as a result of the ROUTE-TO-PA project lead to changes in government policies, rules or procedures ?	(19) To what extent did the ROUTE-TO-PA project lead to the co-creation of innovative services?

In summary, with respect to the year 1 Societal Model of Workpackage 3, within the second year of the project we further operationalized the concept of transparency, in terms of models of democracy, and made advances, with respect to this, in terms of defining types of possible impact, on this level. This facilitates integration of the societal model with respect to the year 2 Community Model, and with respect to success criteria relating to Workpackage 5.

3 MODEL FOR ANALYSING INTERACTIVE ACTIVITIES IN OPEN DATA USE: JOINT PROJECTS AND DIALOGUE GAMES

3.1 BACKGROUND: ANALYSING ONLINE COMMUNITIES

The research literature on online communities has been the subject of several research syntheses (for a recent review, see for example: Malinen, 2005). It appears that any question that can be asked about the functioning of human action in groups or collectives, across various branches of psychology, sociology and social anthropology, can also be asked in this case. Such questions include those pertaining to individual participants, as a way of understanding forms of participation (motivation, engagement, in relation to social characteristics) as well as aspects of group dynamics (who communicates with whom, with what frequency? What is the role of interpersonal relations, emotional regulation, a sense of belonging to a community?). A range of further questions have been asked in relation to the influence of computer-mediated communication at a distance on phenomena emerging from online communities, such as the reasons behind trolling and flaming, well-known phenomena in social psychology such as group exclusion and antisocial behaviour, with respect to communication media characteristics (e.g. possibility of anonymity; typewritten communication with a permanent written trace as a source for further group reflexivity).

The most basic question to be asked is **what constitutes a ‘community’** (etymologically, a collective of people who possess something (in)tangible in common)? Much follows from exploring this question. What is held ‘in common’ may be some type of tangible object or product — such as a shared housing project, or a text in Wikipedia — but may also be intangible, such as a system of ideas and values (e.g. a religious, ideological or political community). The latter relates to what has been termed a *feeling of belonging* to a community (Rheingold, 1993), or a *sense of community* (Blanchard & Marcus, 2004), and points to the fact that participants in online communities are bound together, and motivated to participate, just as much by the interpersonal relations that they establish, and their shared sense of ‘belonging’, as by shared goals of producing something tangible together (such as a new programming language) or mutual interest in sharing information, knowledge and experience.

From the perspective of interactive dynamics, communities are characterised not by isolated, sporadic, individual messages that may nevertheless contribute to shared goals (which can be defined as “cooperation”), but rather by *collaboration*, involving joint agency, oriented towards, precisely, creating shared understanding about what the community is, and the meaning of specific tasks that it seeks to achieve (Roschelle & Teasley, 1995; Baker, 2015). Communication on online forums can often take the form of decoupled action, where many users post a few messages then remain silent (either they leave the community, or remain as ‘lurkers’). In some cases, more tightly coupled zones of collaboration will emerge (Fréard et al., 2012), and these are signs of ‘communityness’. Zones of collaboration (Baker, 2015) involve a shared focus (e.g. all of a group of participants focussed on the same open data/visualisation) and quasi-synchronous interpersonal communication involving all that displays effort towards shared understanding (Clark & Schaefer, 1989). Methodological tools have been developed for analysing the quality of collaboration, in on/off-line communities or groups (Détienne, Baker & Burkhardt, 2012).

There are two main theoretical perspectives that underlie the study of online communities: the **theory of situated learning** (Lave & Wenger, 1991) and **social network analysis [SNA]** (e.g. Scott, 2013; Viegas & Smith 2004; Welzer et al, 2007, 2011).

The theory of situated learning brings valuable concepts to Workpackage 3 of the ROUTE-TO-PA project, notably that of an epistemic **community of practice** (whose emergence we aim to favour across partners, mediated by SPOD-TET), **legitimate peripheral participation** (as a starting point for entry into the community) and a **developmental theory of learning**, on the levels of both individual participants, whose **trajectories of participation** (Dreier, 1999) involve moving towards playing more

central or active roles, and on the level of the community itself, which **develops** to involve more closely coupled interactions (zones of collaboration), epistemically and interpersonally (a “sense of community”, belongingness). However, such general concepts do not make explicit links, via analysis methods, to interaction data, to what actually occurs in online communities, the participants’ goals and the nature of their interpersonal communication.

Social Network Analysis aims to achieve precisely what it says: to analyse (‘webs’ of) social relations between people, in the manner of socio-grams (who has affinity with whom?) or else, across websites (who cites whom?), and within online communities (who communicates with, refers or replies to whom?). Given that such webs of relations correspond to graphs (in the mathematical sense of the term), a large number of algorithms and automatic analysis tools have been developed, to explore their properties (such as centrality, connectedness, density, clustering, etc.).

However, *such diagrams require (qualitative) interpretation*. For example, suppose a participant emerges as ‘central’ (many dense relations with others); this could mean that that participant is in some sense a “leader”, or else a “troll” (who attracts much communication aiming at countering abuse), or many other things besides. Although the SNA approach is powerful for analysing large-scale data, structural analyses usually concentrate entirely on the *form* of network patterns, without addressing the *content* generated by the members of the network. This could affect the reliability of conclusions drawn from analysis of the patterns. For example, existence of exchanges between social actors does not necessarily mean that some form of collaboration or knowledge elaboration is occurring between them. Furthermore, this type of analysis is usually conducted on data collected relatively over large periods of time (and requiring large quantities of data), without distinguishing which traces are related to goal-oriented activities. This makes interpretation difficult for understanding the collective dynamics of knowledge co-elaboration in online communities.

Entering into qualitative analysis of forms of participation, the notion of an **interactive role** (the role that a participant actually plays in an interaction, evolving over time), distinct from but related to institutionalised **status** (e.g. “admin”, “moderator”), is arguably an appropriate meso-level of analysis.

The notion of “role” is anchored in mid-twentieth century research in sociology and social psychology. In sociology, the aim is to provide a global view of social systems, highlighting structures, cultural models, social norms and the statuses of participants (in particular, their rights, duties, and power). In this view, roles (Linton, 1936, cited in Oberlé and Drozda-Senkowska, 2006) refer to the dynamic aspects of (social) statuses. In the same period, and within a more interactionist approach, research in social psychology considered roles in terms of the emergence and differentiation of participants’ behaviours in specific, goal-oriented situations. Bales’ seminal research (1950) is probably the most influential in this direction. Research was mostly directed at analysing group composition (size, configuration of emerging roles) as well as at training groups to be more efficient (e.g. Benne and Sheats, 1948).

In more recent approaches in psychology, the notion of role remains anchored in this interactionist tradition, in considering knowledge co-elaboration as it is manifested through collective action, and dialogue in particular. We consider this approach to be particularly relevant for studying knowledge co-elaboration in interactions in online epistemic communities. Based on fine-grained analysis of interactions, through the use of coding schemes, the identification of “interactive roles” corresponds to distinctive and regular individual behaviours emerging from the interaction. The distinction between epistemic (types of knowledge evoked) and dialogic (communicative function) dimensions of contributions enables the identification of roles with respect to each dimension as well as their combinations.

This latter approach has been adopted in a study of an architectural design meeting (Baker et al. 2003; 2009) where an analytical framework was developed that aimed to bring out the nature of participants’ contributions in a way that distinguishes content and function dimensions. The epistemic dimension was related to content, the type of knowledge brought into the discussion: nature of constraints and solution dimensions (ad hoc for the considered architectural domain/task). The other dimension was related to the argumentative function (thesis proposal, argumentation...).

Roles of participants along each dimension (what main type of knowledge did they evoke? In what way, for or against what, did they argue?) were combined, to give a summary of their overall “interactive profiles” (i.e. an aggregation of interactive roles). This approach has been further developed to study activities and roles in online communities, such as OSS communities (e.g. Barcellini et al. 2008a, 2014) and more recently Wikipedia (Fréard et al. 2010). In summary, institutionalised roles, or social “statuses” (such as “manager”, “university lecturer”, “administrator”, “parent”, etc.) need to be distinguished from “interactive roles” that participants in an interaction adopt spontaneously. A participants’ interactive role is a global vision of how they participated, over the whole interaction or a sequence of it, in a way that is distinct with respect to the other participants (Baker, 2002).

On the basis of this background research, **the approach we have developed for analysing SPOD-TET interactions at the community level** is based on **qualitative-quantitative analysis** of the **meaning-making** and **knowledge co-elaboration processes** that are produced. This involves identifying the specific **joint projects** in which participants are engaged (in relation to general objects of activity of social groups), the **forms of dialogue** in which they engage in order to achieve these projects, and, with the latter, the **emerging interactive roles** which characterise the actions and trajectories of specific participants. As we describe in the next section, our community-level analysis and evaluation approach is based on combining the **theory of Joint Projects in Interaction** (Clark, 1996, 1999) and the **theory of Dialogue Games** (Wittgenstein, 1978; Levin & Moore, 1983).

3.2 THEORETICAL FOUNDATIONS: JOINT PROJECTS AND DIALOGUE GAMES

Our approach to analysing the interactions produced in online SPOD-TET communities aims to understand, quite simply, *what the participants are trying to achieve*, and *how they try to achieve their aims*. The former is understood in terms of Joint Projects and the latter in terms of dialogue games. Such analysis is the basis for (normative) *evaluation*, of the extent to which the online communities are moving in the direction that is aimed for by the project (see section 5 of this deliverable). That aim, as we discuss later in this document, is simply that the communities **are focussed on co-creating the meaning of open-data/visualisations**, as a means to **achieving their aims**, in a manner that thereby **moves towards effective transparency**. The focus, at the community level is simultaneously on **participants** — what roles do they play in the online communities, within specific dialogue games? — and on **content** — what are the participants trying to do?

3.2.1 JOINT PROJECTS

Clark (1996, 1999) argues that theories of interaction, dialogue, conversation emphasise (para)verbal, linguistic, communicative actions without integrating the physical or ideational joint projects within which they take on meaning.

Consider, for example, the following interaction (Clark, 1999):

Jane:	Okay ... now
	This way
Kenneth:	Right.
Jane:	A little bit more
	Right ... here
	Fine, we’re done, thanks
Kenneth:	It looks great

The interaction shown above only makes sense if one knows that the **joint project** of Jane and Kenneth is to **move the dining room table**, as shown below:

	Verbal actions	Physical actions
Jane:	Okay ... now	Jane lifts her end of the table Kenneth lifts his end of the table
	This way	Nods towards the new location
Kenneth:	Right.	
Jane:	A little bit more	Kenneth moves his end of the table as directed
	Right ... here	Sets down her end of the table. Kenneth sets down his end of the table
	Fine, we're done, thanks	
Kenneth:	It looks great	

Although such contextual actions are commonly noted in transcriptions of interactions, they are not usually considered to be integral to the interaction itself. Clark's approach precisely considers "joint projects", comprising physical and verbal actions, as the primary unit of analysis.

In the above example, spoken dialogue has the main role of **coordinating physical action**. However:

- (1) *Dialogue itself needs to be coordinated*, in terms of mutual understanding, perception and agreement (Clark, 1996, 1999; Allwood, et al., 1991; Bunt, 1989, 1995), *within the dialogue itself*;
- (2) Not all joint projects concern physical tasks, others are *ideational* (e.g. information exchange) or more generally, are performed in order to make a *transaction* (e.g. making a decision).

This is shown in Figure 2.

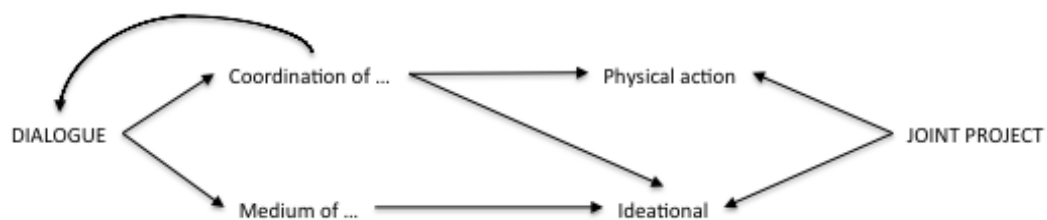


Figure 2. Dialogue and Joint Projects

Within exchanges of messages, interactions, on SPOD-TET, we distinguish the main joint project, the transaction that is aimed at, whether this is ideational (e.g. co-elaborating understanding of data) or physical (e.g. introducing an open-data visualisation).

With respect to SPOD-TET interactions, we therefore consider firstly: the main **object of the activity** of a social group (e.g. citizens in Groningen concerned with halting population decline) in terms of the societal model.

SPOD-TET is used to achieve specific **joint projects** that emanate from the object of activity (cf. the Societal Model), and involve discussing open data (visualisations) that are pertinent to this, specific to particular social groups and their usage scenarios (cf. Workpackage 2 of this project).

We divide these transactional level joint projects on SPOD into the following four component phases:

Table 4. Phases of Joint Projects focussed on meaning-making for open data (visualisations)

Joint Project Phases	Definition, description
PROBLEM-FRAMING	Defining together the main problems, goals, of a joint project involving open data (visualisation) use
IDENTIFICATION	Identifying data sets that are relevant to the joint project
INTERPRETATION	Trying to reach shared understanding of the data (visualisations)
PRODUCTION	Joint production of the problem solution, relating to the joint project, on the basis of the open data visualisation
(OTHER)	Phases of discussion not directly linked to a clearly identifiable Joint Project

These are canonical phases, in which case, in real interactions, some phases may be omitted (e.g. participants might move straight into open data identification), there may be iterations of the structure or its elements.

In order to accomplish each joint project phase, the SPOD-TET community participants engage in particular **dialogue games**, as explained in the next sub-section of this document.

For example, in the Joint Project element called “framing a problem”, a *REGULATIVE* dialogue game may be engaged in; but also, possibly, a *HELPING* dialogue game. Similarly, in the interpretation phase, participants might *CO-ELABORATE* joint understanding, and/or they may *DELIBERATE* about this. There is no necessary one-to-one matching between joint project phases and dialogue games, i.e. they are separate yet related dimensions of analysis.

Figure 3, below, illustrates the relations between objects of activities, joint projects and their component phases:

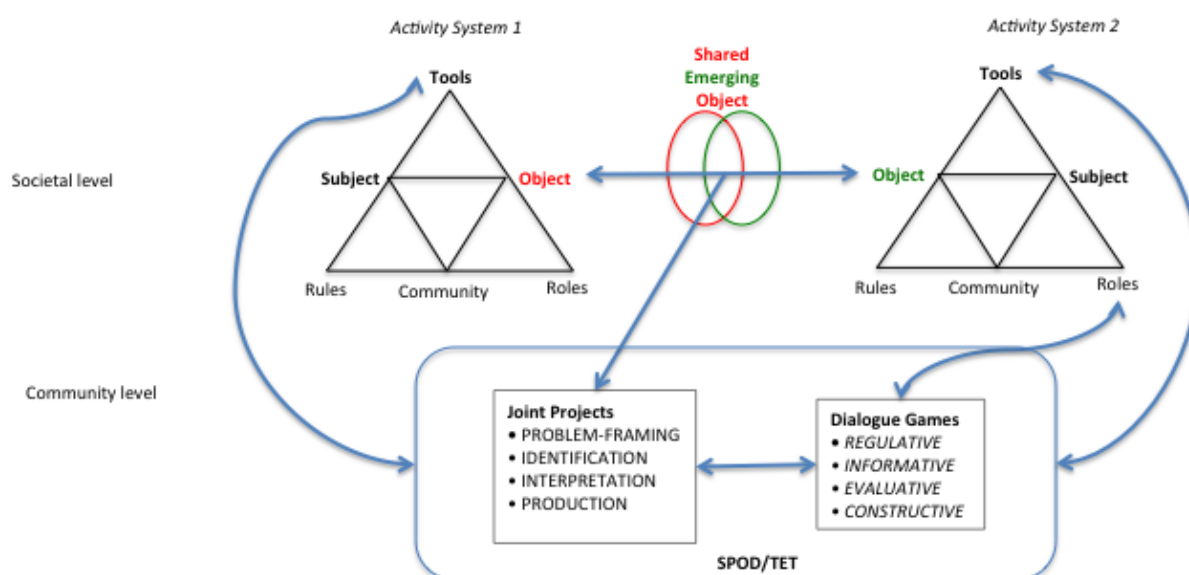


Figure 3. Relations between objects of activity, joint projects and dialogue games

In the next subsection we describe the research background of the dialogue game approach.

3.2.2 DIALOGUE GAMES

Our analysis approach — based on the theory of **dialogue games**² (Power, 1979; Levin & Moore, 1983) — aims to capture **patterns of joint action in dialogue**, within online communities.

In substance, we propose that this approach is appropriate here because:

1. It is a means for understanding forms of participation, and types of joint activities within the online communities, as well as their developments, by asking the question *“what kinds of joint activities (dialogues) are the participants involved in, on SPOD-TET, what are they trying to achieve, and who is doing what within those dialogues?”*.
2. it is a meso-level analysis, that is practically feasible for all concerned partners, avoiding painstaking analysis of every single message and communicative act;
3. it enables theoretical integration with work carried out in year 1 of the project, concerning Activity Theory, analysis of types of democracy, concepts of transparency and theories of online communities of practice;
4. it provides an analysis that is preliminary to understanding individual participants in the group (via forms of participation), as part of year 3 work in workpackage 3;
5. as a descriptive qualitative analysis, it can give rise to a normative — quantitative — evaluation of forms of participation on SPOD-TET (workpackage 5).

We describe the theory and model, then give some examples of its application. Relations to other workpackages are discussed, notably Workpackage 5, wherein the descriptive model becomes a basis for normative evaluation of the structure and evolution of collective activity.

3.2.2.1 THEORETICAL BACKGROUND

The theory of dialogue games originated in Wittgenstein’s (1978) notion of a “language game”, proposed with the aim of dispelling the idea that using language is a matter of expressing meanings, seen as private thoughts. For Wittgenstein, the meaning of an utterance such as “Slab!”, uttered by a foreman to a worker on a building site, is not to be found in private mental representations; rather, it is inherent in the rules of the language game being played, which are that, when the foreman makes such an utterance, the worker searches for a slab of rock, and brings it. Language games are situated in “forms of life”, and there is no a priori limit to their number. Already it should be noted that “language games” do not only involve linguistic actions, but also physical actions (such as bringing a slab, or, in our case, importing a visualisation from TET to SPOD). So the term “dialogue”, here, must be understood as multimodal joint action, where communication can be expressed in words (in typed messages) or using other actions on the interface.

Within cognitive science research, both Power (1979) and Levin and Moore (1983) propose formalisations of dialogue games, as a means for extending theories of meaning beyond the individual phrase, uttered as a speech act: the phrase, when uttered, takes its meaning, for speakers and hearers depending on the dialogue game within which it is situated. For example, the phrase “*p*: It is raining” looks like a conventional assertion. In a dialogue game called “information seek”, following the question “what is the weather like?”, *p* takes on the functional meaning “information provide”; in a dialogue game called “deliberate action”, following a proposal “let’s go out for a walk”, *p* takes on the indirect function of “refusal”, as well as the direct function “counter argument”. The functional meanings expressed by such expressions in dialogue games are called the *moves* that they make in the game.

In dialogue, conflicts may concern not only what is believed to be the case, but also the appropriateness of utterances: this is conflict on the level of the shared goal of the dialogue, the

² In this document, “Dialogue Game” will sometimes be abbreviated to “DG”.

game that is agreed as being played. For example, a move such as “counter argument” may be seen as inappropriate by a dialogue participant who wants to play a “co-construction” or even a “brainstorming” game. The conflict concerns the dialogue game that the participants think they are playing. This could be glossed as: “I thought we were trying to build some idea together? But you keep criticising. Are you proposing that we change the game to critical deliberation?”.

Levin and Moore (ibid.) give the following examples of dialogue games: *Helping, Action-Seeking, Information-Seeking, Information-probing, Instructing, Griping*³ ... to which list Mann (1988) adds *Permission-seeking* and *Dispute*. Within the fields of logic and argumentation theory, specific types of argumentation dialogue (games) have been proposed (Hamblin, 1973; Barth & Krabbe, 1982), involving rules of the game designed to ensure its convergence on a rational and determinate outcome (who won or lost). It is anticipated that the dialogue games to be played with SPOD-TET will be mostly cooperative, without attempts to win by anyone, ‘at all costs’. Dialogue games can thus be *cooperative* (one or more participants help others to achieve their goals, or all share a common goal) or *competitive* (winner/loser).

A further important characteristic of dialogue games is their degree of *(a)symmetry*. In abstract terms, games such as HELPING are asymmetrical, since someone helps and someone else receives that help. Similarly with EXPLAINING: an explainer and another who receives those explanations. But there can also be symmetrical versions of these games — collaborative explanation, each helping the other, or exploring what to do together. Finally, there can also be ‘mixes’ or ‘flavours’ of dialogue games — for example, a CO-CONSTRUCTION game that nevertheless contains some elements of CRITICAL ARGUMENT games. Finally, there are ‘families’ or classes of games, having shared characteristics. For example, the ARGUMENTATION game has many variants, according to its degree of symmetry (do each have the right to attack and defend, or is there one proponent and one opponent?).

3.2.2.2 WHAT’S IN A GAME?

By analogy with board games, such as chess or draughts, dialogue games have the following components:

- **‘players’**: the participants in the game, having particular identifying names (e.g. Julie124, James66); participants play particular **rôles**, specific to the dialogue game (e.g. HELPER, HELPED, INFORMER, REQUESTER, COLLABORATOR, ...)
- **‘pieces’**: the tangible elements that can be acted upon, on the interface, in our case, words written in SPOD messages, “like” buttons clicked, visualisations brought into the SPOD, ...
- a **‘board’**: SPOD and TET tools
- **moves** that can be made by the players with the pieces on the board: e.g. INFORMATION-PROVIDE, by importing a visualisation into the SPOD, or by writing a message in the SPOD. *Definition of what move has been made depends on which (dialogue) game is being played;*
- **starting position**: this involves the playing of an initial dialogue mini-game (that could be called “opening”), in which one player ‘bids’ for a game (e.g. “Could you help me to find schools in south Dublin?”) and another accepts to play that game (e.g. “Sure; I’ll just go and look at TET” → HELPING dialogue game initiated).
- **ending position**: depending on the game, this is when its goal is achieved (e.g. the requested information has been provided, or, a joint decision has been agreed on, or a new visualisation has been co-constructed, ...)

³ In the rest of this document we shall retain the use of the somewhat uncommon word “gripping” (OED: “***gripe*** - VERB [no object] *informal* - Complain about something in a persistent, irritating way”), given its initial use by these authors, even though critical remarks expressed by SPOD users may not be of this kind.

- **goal:** this is partly inherent in the definition of the dialogue game that has been initiated: if the game is “x helps y to use z”, the goal of the game that y should make manifest that (s)he has understood how to use z.
- **content:** this is the specific content of the goal (e.g. the specific type of action to be carried out, such as “using TET to make a bar chart of public spending over the last 10 years”, or “obtaining information about ...”;
- **rules:** they define the types of moves that are attached to rôles and in some cases when these moves must or may be made. It is a rule governing the “helping” dialogue game that the helper helps the helpee. In more specialised argumentation dialogue, or deliberative games, rules may include such things as “a participant whose proposal is criticised must defend it” (otherwise, there would be no argumentation game being played) and, with respect to ending positions, “the person whose view has been criticised and has no more to say has lost the game”.

It is important to note that *there can be games within games*: an INITIATION game within a HELPING game. Other examples might include an INFORMATION-SEEKING game within a HELPING game.

A dialogue game will generally coincide with a **thread** in the SPOD, but this is not necessarily the case:

- a single thread could include more than one dialogue game;
- a single dialogue game could encompass more than one thread.

The thread structure is nevertheless a good heuristic guide to dialogue game identification, as are manifestations of initiation (e.g. request for help, information) and termination (e.g. thanks, acknowledgements, goodbyes, etc.) of games.

Examples from real data, obtained from project partners’ SPOD/TET versions, are presented and analysed in section 3.4 below.

3.2.2.3 RELATIONS TO FORMS OF DEMOCRACY AND TRANSPARENCY

In the work of year 1 in workpackage 3, we defined for all pilots, the Activity Systems of PAs and potential user groups, focussing on tensions within and between them, in relation to three forms of democracy (monitorial, participative, deliberative).

Relations between elements of the societal model are as follows:

- the object of activity, for a particular social group, as defined in task 3.1, will correspond to the sets of goals of the dialogue games in which the group engages. For example, if the object of activity of a particular social group is to “co-create ways of dealing with population decline”, this should translate into sets of dialogue games whose goals are, mostly, to co-create ideas.
- tensions between activity systems will most probably correspond to different types of argumentation dialogue games. But there can also be dialogue game tensions (P1 wants to play a co-construct DG, whereas P2 wants to play a critical examination DG; or P1 disputes that a particular move is appropriate, given a co-construct game is being played) and tensions about contents (about what is to be discussed). Relations between build up and release of tensions (cf. Andriessen, Baker & van der Puil, 2011) and expression of affects (Baker, Andriessen & Järvelä, 2013) are to be explored.

The exact correspondences, in a particular case, between object of activity and sets of dialogue games, are an issue for empirical research.

In terms of types of democracy, correspondences with dialogue games are as follows:

Table 5. Forms of democracy and corresponding dialogue games

<i>Type of democracy</i>	<i>Possible dialogue games</i>	<i>Typical types of content</i>	<i>Participants</i>
Monitorial	<ul style="list-style-type: none"> • None (information disclosed by PAs brings forth no comment from citizens) • INTERPRETATIVE (group of citizens monitor PA data, e.g. budget, try to understand the data together – e.g. “does the data mean or show that spending on associations is actually reduced this year, or not?”) • CRITICAL ARGUMENTATION (citizens express negative evaluation of data, policy, to government, giving reasons, engage in argumentation dialogue with PA representatives) 	PA budget PA investment and real-estate projects	Citizens Citizens to PA
Deliberative	<ul style="list-style-type: none"> • DELIBERATIVE ARGUMENTATION (citizens and public representatives engage in type of argumentation dialogue which is cooperative exploration of arguments for or against particular policies) 	Proposed policies	Citizens-citizens Citizens-PA
Participative	<ul style="list-style-type: none"> • CO-CREATION (on the basis of deliberative argumentation, -- or indeed, during it – new policy decisions are jointly shaped) 	Policies	Citizens-PA

Defining the corresponding dialogue games is one way of operationalizing these concepts of types of democracy, in terms of what people actually do/say.

We discussed nominal and effective **transparency** above (§2 of this document). **Effective transparency** will thus correspond to a predominance of the generation of **dialogue games that involve co-construction of meaning**, and elements of joint projects involving **interpretation**.

In sum, the dialogue game approach is one specific way of operationalising certain aspects of research on **(online) communities of practice** (Lave & Wenger, 1991), i.e. the central objective of Task 3.2. **Forms of participation** are represented, essentially, by dialogue games, and, on the individual level (how does one particular participant participate), by **the set of rôles the participant assumes over a set of dialogue games**. The phenomenon of **legitimate peripheral participation**, is represented by the person’s **progressive inclusion in more and more dialogue games**, and by **change towards an initiating rôle** within them. In sum, the community is apprehended in terms of the nature of the dialogue games it plays.

The aspect of the individual in the group — what rôles does that individual play in what dialogue games? — is already a pointer towards the work of year 3 in workpackage 3, that focusses on this aspect from a third-person perspective (that of the researcher-observer), to be complemented with the participants’ first-person perspectives (e.g. how do their representations of the PA change?). There is also a link here with the notion of a participant’s **degree of engagement** in the community.

3.2.2.4 DIALOGUE GAME STRUCTURES AND EXAMPLE DIALOGUE GAMES FROM THE RESEARCH LITERATURE

The general dialogue game structure is as follows:

Table 6. General structure of dialogue games

DG Name:	Unique identifying name of the dialogue game
Participants:	A list of the participants in a particular instance of the game
Social statuses:	(if known) the real-life social rôles of participants, e.g. “citizen”, “developer”, “public administrator”
Rôles:	The rôles of the dialogue game
Participants/rôles/statuses:	Participants assigned to rôles, with their social statuses
Communications:	What actions (communicative or not) the rôles are associated with
Goals:	What the dialogue game is supposed to achieve
Content:	The specific content involved (e.g. helping, to create a histogram with financial support given to types of associations over the past 10 years)
Versions:	Other possible versions of the dialogue game, with different combinations of communications
Sub-games	Dialogue games of which the main one is constituted (if any)
Threads/messages	Numbers of threads with numbers of messages in each
Comments:	Free additional remarks

The following examples are derived from existing research. From this starting point, the project has developed a full set of dialogue games, sufficient for analysing the data, in an iterative and collaborative manner, on the available data.

Many dialogue games have both symmetrical and asymmetrical versions (for example, asymmetrical HELPING, where A helps B, symmetrical helping, where A helps B and B helps A).

Different versions of the games are produced when roles are occupied by several participants, with different combinations of social statuses.

Tables 7a, b, c, d, e, f. Dialogue games derived from the research literature

DG Name:	HELPING
Gloss:	Someone helps someone else to do something
Participants:	Participant1, Participant2
Social statuses:	SPOD-administrator, citizen
Rôles:	Helper, Helped
Participants/rôles/statuses:	Participant1/Helper/SPOD-administrator Participant2/Helped/citizen
Communications:	Helped REQUESTS help Helper: PROVIDES help
Goals:	Participant2 able to perform action
Content:	An action – the specific one HELPED wants to perform
Versions:	<ul style="list-style-type: none"> • HELPING-sym: in a symmetrical way, participants can both give and receive help (“helping each other”) • HELPING-spon: Helped does not request help explicitly – Helper provides help spontaneously, perhaps on perceiving other’s difficulties
Sub-games:	CLARIFICATION (clarification of meaning of what exactly help is required on)
Threads/messages	Numbers of threads with numbers of messages in each

Comments:	HELPING is a DG concerning action, i.e. enabling someone to do something (such as how to create a visualisation, or add a “like” tag). When the help concerns <i>providing information</i> (other than on how to do something), this counts as an INFORMATION-SEEKING DG. The “rôle” variables can of course have several participants as values. There could be different social statuses – e.g. one citizen helps another – or this may simply be unknown.
------------------	---

DG Name:	INFORMATION-SEEKING
Gloss:	Someone provides information to someone else
Participants:	Participant1, Participant2
Social statuses:	SPOD-administrator, citizen
Rôles:	Information-seeker, Information-provider
Participants/rôles/statuses:	Participant1/Information-seeker/citizen Participant2/Information-provider/citizen
Communications:	Information-seeker REQUESTS information Information-provider PROVIDES information
Goals:	Information-seeker acquires requested information
Content:	Task-relevant information (e.g. where the dog-toilette shops in the city are to be found)
Versions:	Extension of the communications to include further specifications or queries about the information requested and provided
Sub-games:	CLARIFICATION HELPING EXPLAINING
Threads/messages	Numbers of threads with numbers of messages in each
Comments:	This is about wanting to know something, rather than concerning how to do something (see HELPING)

DG Name:	DELIBERATION
Gloss:	People discuss in order to make a decision
Participants:	Participant1, Participant2
Social statuses:	citizen, citizen
Rôles:	Co-deliberator, Co-deliberator
Participants/rôles/statuses:	Participant1/ Co-deliberator /citizen Participant2/Co-deliberator /citizen
Communications:	Co-deliberator PROPOSES decision Co-deliberator PROPOSES modified version of decision Co-deliberator GIVES REASON in favour /against decision Co-deliberator ACCEPTS/REJECTS proposed decision
Goals:	Participants come to agree on decision, by examining reasons for or against it
Content:	A decision to be made (proposed)
Versions:	• DELIBERATION-asym: in an asymmetrical way, one or more participants may give reasons for/against decision, with others remaining passive
Sub-games:	CLARIFICATION
Threads/messages	Numbers of threads with numbers of messages in each
Comments:	It is important for DELIBERATION that participants give reasons for or against proposed decisions. If their rôles split into some arguing only in favour and others only against, then this would count as an ARGUMENTATION DG.

DG Name:	ARGUMENTATION
Gloss:	People disagree about something (the interpretation of some data, the decision to be made, the value of some data, ...) and take sides, each trying to impose their own views
Participants:	Participant1, Participant2

Social statuses:	citizen, citizen
Rôles:	Proponent, Opponent
Participants/rôles/statuses:	Participant1/ Proponent /citizen Participant2/Opponent/citizen
Communications:	Proponent PROPOSES a view (solution, decision, interpretation, explanation, ...) Opponent REJECTS proponent's view Proponent DEFENDS own view, ATTACKS opponent's attacks Opponent ATTACKS proponent's views and defenses
Goals:	Deciding who is right
Content:	A decision to be made (proposed), a problem solution, some information
Versions:	<ul style="list-style-type: none"> • ARGUMENTATION-simple: only proponent has a view to propose and defend; opponent simply attacks it • ARGUMENTATION-mixed: both proponent and opponent have own, opposed, views
Sub-games:	CO-CREATE (a shared negotiated resolution of conflict)
Threads/messages	Numbers of threads with numbers of messages in each
Comments:	The adversarial, non-cooperative, version of DELIBERATION

DG Name:	CO-CREATE
Gloss:	Collaborative problem-solving
Participants:	Participant1, Participant2
Social statuses:	citizen, citizen
Rôles:	Co-creator, Co-creators
Participants/rôles/statuses:	Participant1/ Co-creator /citizen Participant2/Co-creator /citizen
Communications:	Co-creator PROPOSES solution to shared problem Co-creator PROPOSES modified version of proposed solution Co-creator PROVIDES INFORMATION relevant to solving shared problem Co-creator ACCEPTS/REJECTS proposed solution
Goals:	Agree on a solution to the shared problem
Content:	The specific problem to be solved, together
Versions:	<ul style="list-style-type: none"> • CO-CREATE-asym: one or more participants do nearly all of the proposals of solutions, and their modified versions, others remaining more passive, or else making queries, general suggestions, etc. • Other social statuses of participants, e.g. public administrators
Sub-games:	CLARIFY (problem to be solved) DELIBERATE (between alternative solutions)
Threads/messages	Numbers of threads with numbers of messages in each
Comments:	none

DG Name:	HELPING
Gloss:	Someone helps someone else to do something
Participants:	Bill2, SarahD, PeteN
Social statuses:	Citizen, moderator
Rôles:	Helper, Helped
Participants/rôles/statuses:	Bill2/Helped/citizen PeteN/Helper/moderator SarahD/Helper/citizen
Communications:	Helped REQUESTS help Helpers: PROVIDE help

Goals:	Bill2 able to perform action
Content:	Performing actions to get and visualise information on funding of sporting associations
Versions:	none
Threads/messages	Threads: N=1 Thread1: N messages=15
Comments:	none

3.2.2.5 FROM THE QUALITATIVE TO THE QUANTITATIVE

The first step of analysis is **qualitative**: ascribing Joint Project and Dialogue Game categories to the interaction corpus.

Within the framework of such qualitative coding, **quantitative analysis** is performed, as follows:

- each Joint Project, is analysed from the point of view of dialogue games — the number of different types — and from the participant point of view (numbers of messages performed by each)
- within each dialogue game, the participants who occupy each of the defined **interactive roles** is noted.

When analysing successive joint projects across time, it is therefore possible to identify the evolution of roles of particular participants.

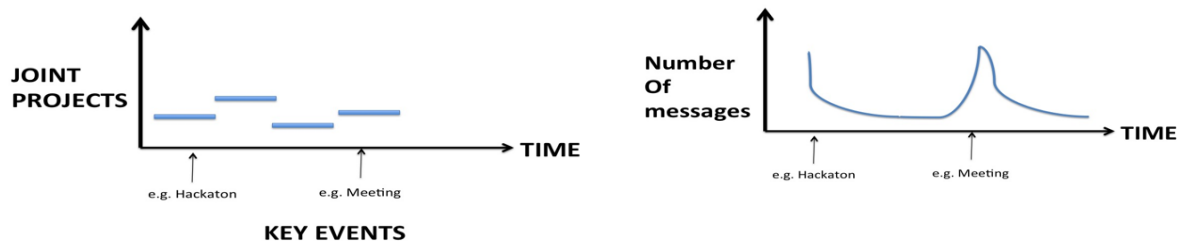
The general table to be filled with quantitative data, following qualitative analysis, is shown below in Table 8:

Table 8. General Table for SPOD/TET interaction analysis

Dialogue transcript (with visualisations)			Joint Projects		Dialogue games			Content		Space/tool
Participant	Time of message	message	JP name	JP phases	Category	DG-name	Roles	Link with open data (viz.): 1. linked to an information source (OD, website, etc.) or not? (Y/N) 2. If Y, specify the type of information source (OD, weblink, wiki, article, ...)	Free list of topics, chosen by analyst, depending on nature of context, joint project	e.g. agora, co-creation room, ...

Other tables for quantitative analysis are reproduced in **Appendix 1**.

Visual representations are used to chart numbers of messages and participations across time, for the analysed joint projects, in relation to specific events that would have stimulated interaction (e.g. hackathons), such as shown in Figure 4 below:



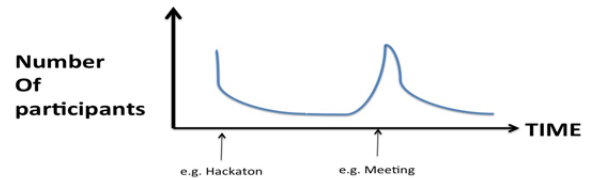


Figure 4. Visual chronological representations of SPOD/TET interaction activity

Depending on the joint projects and Public Administrations' SPOD/TET platforms, visual representations of frequencies of other quantitative data are used. These are shown with respect to specific analysis results in D5.2.

As we discuss in **Section 5** below, **the qualitative-quantitative analysis is designed to enable evaluation questions to be answered** in specific cases — for example:

- *to what extent are the SPOD/TET interactions focussed on open data visualisations?* (proportions of messages per visualisation),
- *to what extent is effective transparency present?* (proportions of interpretative and constructive dialogue games in the interactions), or
- *to what extent is an online epistemic community emerging?* (increasing specialisation of interactive roles across joint projects; participation distributed more evenly across participants, ...).

In the next subsection we describe how the operational dialogue game analysis method was developed.

3.3 DEVELOPMENT OF THE COMMUNITY-LEVEL ANALYSIS METHOD

It should be noted that Dialogue Game theory has been mostly elaborated by computer scientists, linguists and logicians, on the basis of dialogues invented for the purpose of illustrating theories. To our knowledge, *this theory/model has not hitherto been applied to the empirical analysis of real, unconstrained dialogues*, as is the case in the present work. The development of this original analysis method therefore constituted considerable research effort within the project, which will give rise to high quality research publications.

The Community Level — Joint Project/Dialogue Game — analysis method was developed using standard methods in dialogue research (e.g. Bakeman & Gottman, 1997), the main steps of which are as follows:

Step 1: elaborate first version of analysis categories.

We began elaborating dialogue game analysis categories from the dialogue game types already developed in the research literature (reproduced above).

Components of Joint Projects (see above) specifically relating to open data/visualisation use were defined on the basis of *cognitive task analysis* (Schraagen, Chiplan & Shute, 2000): they involve *framing* the specific problem to be solved in relation to the broader on-going joint project, *identifying*, creating (with TET) and importing into SPOD the relevant visualisations, *interpreting* the visualisations in relation to the problem, and *production* of problem solutions on this basis.

Step 2: confront categories with corpus sample

In order to check *coverage* of the corpora by the analysis categories (to what extent can they take the data into account?), the initial versions of categories were applied to the analysis of samples of the SPOD/TET interaction corpora (2 joint projects with associated dialogue games) using these categories. This was carried out by each partner participating in empirical work (CNRS Paris, Wise & Munro Den Haag, National University Ireland Galway, University of Utrecht).

Prior to analysis, the corpus samples were segmented into units on the level of *sequences*, i.e. task and goal based units (Grosz & Sidner, 1996) that correspond to elements of collaborative problem solving.

In order to coordinate this work, CNRS Partner 2 developed and distributed *guidelines for SPOD-TET interaction analysis* (reproduced in **Appendix 4** of this deliverable).

Step 3: extend analysis categories

On the basis of step 2, each partner participating in the analysis identified mismatches between categories and data, and, when they occurred, proposed extensions/changes to the initial set of categories in order to address the mismatches.

Step 4: integrate and refine

At a joint workshop organised in Paris (Thursday 27 October 2016), participants discussed their proposed extensions to the analysis method and reached agreement on a modified joint version that was able to take into account data from different SPOD/TET versions.

This new joint version was refined in order to operationalize it in terms of success criteria for evaluation (see **section 5** below), and to take into account advances with respect to the societal model (forms of democracy, definition of effective transparency). In addition, dialogue games were grouped into higher-level categories, this being a level of analysis that could be more relevant or else sufficient, in specific cases.

The final version of the dialogue game categories, distributed to all concerned partners following the Paris workshop, is reproduced in **Table 9** below. On the basis of cognitive task analysis, Joint Project phase categories remained as shown in **§3.2.1** above.

Table 9. Final version of dialogue game categories (revised November 2016).

DG category	DG	DG Definition	Roles
REGULATIVE	Collaborative Task Regulation (CR)	Discussion on goal setting, organisation of the collaborative task	<i>Regulator</i> <i>Participant</i>
	Social Interaction management (SC)	Openings, closings of interaction, friendly greetings, mutual support, discussion organisation, etc.	<i>Regulator</i> <i>Participant</i>
INFORMATIVE	Helping (H)		<i>Helper</i> <i>Helped</i>
	Information Sharing (IS)	Requesting, giving, pooling information	<i>Info-Requester</i> <i>Info-Provider</i>
	Open Data Sharing (ODS)	(e.g. Present Open Data)	<i>OD-Requester</i> <i>OD-Provider</i>
EVALUATIVE	Argumentation-constructive (AC)	Argumentative interaction with no firm for/against commitments, each attempting to explore pros and cons of proposals (of solutions)	<i>Proponent</i> <i>Opponent</i> <i>Neutral</i> <i>Moderator</i>

	Argumentation-competitive (ACo)	Or adversarial, conflictual. Opposed argumentative roles, each trying to 'win'	<i>Proponent</i> <i>Opponent</i> <i>Neutral</i> <i>Moderator</i>
	Gripping (G)	Negative evaluations, about the tools, the community,	<i>Griper</i>
CONSTRUCTIVE	Deliberation	Collective decision-making (should we do, take, make, ... x or y or z or ...?)	<i>Co-deliberator</i> <i>Moderator</i>
	(Co-)interpretation (Co-Int)	Build together an interpretation of the open data (visualisation)	<i>Interpretation-proposer</i> <i>Interpretation-Critic</i> <i>Interpretation-Elaborator</i>
	(Co-)elaboration (Co-El)	Build together a solution (element) to the (sub-)problem posed within the Joint Project	<i>Solution-proposer</i> <i>Solution-co-elaborator</i> <i>Solution-critic</i>

Step 5: apply to full corpora, generate results

All partners involved in empirical analysis (the partners present at the October 2016 Paris workshop) applied the revised Joint Project-Dialogue Game analysis method to the SPOD/TET interaction data that had currently been produced (i.e. at November 2016) in their own countries.

Quantitative analysis was performed by all on the basis of the qualitative analysis (frequencies and distribution of categories).

Furthermore, partners used the qualitative-quantitative analysis results in order to answer the integrated evaluation questions, reproduced in **section 5** of this deliverable. ***The results of these analyses, applied to existing SPOD-TET interaction data, across partners, are reported in D5.2.***

3.4 EXAMPLE ANALYSES OF SPOD-TET INTERACTIONS FROM ROUTE-TO-PA PARTNERS' CORPORA

In this section we present illustrative examples of analyses of SPOD-TET interactions, from partners in the ROUTE-TO-PA project, using the Joint Project-Dialogue Game community level analysis method. They are intended to give some impression of the range of joint projects and dialogues that can be produced, and to show that the model is sufficiently robust to be applicable across these different sets of interaction corpora⁴.

The full analysis of SPOD-TET interactions produced and analysed during Year 2 is presented in D5.2, together with their evaluation in terms of evaluation questions.

3.4.1 WISE AND MUNRO (PARTNER 3): EXAMPLE SPOD-TET ANALYSIS

3.4.1.1 BACKGROUND

⁴ Data from Prato was gathered during the period end November 2016 – 2017. It therefore could not be fully analysed in time for the end of January deadline of D3.2. There is thus no example reported here from the Prato data. However, results of a preliminary analysis (as of the end of January 2017) are reported in §5.3 below.

The department of Social Services and Employability of the municipality Den Haag favours good relations with local employers. For developing a new collaborative practice that stimulates co-creation of policy and regular feedback during implementation of policies while using open data to make informed decisions, the Route-to-PA project and its tools (SPOD/open data) were introduced to an experimental group of PA's (5) and employers (3). The group first came together for face-to-face meetings for expressing and sharing their ideas on this new form of collaboration and learning more about open data (e.g., open data policy of the municipality, developing ideas on how to use open data in employability issues). After three face-to-face meetings the group members logged into SPOD for the first time and performed an individual usability test. After that test three pilots with SPOD took place, with face-to-face meetings in between to evaluate the pilots. The first two pilots were asynchronous discussions in the Agora and lasted six weeks each. The last pilot was a synchronous session in the co-creation knowledge room during a face-to-face meeting.

Within this process of developing a new collaborative practice, every pilot in SPOD is seen as a separate Joint Project, with a goal and some rules decided upon by the participants themselves. In these pilots the group experiments with co-creation around policy issues with open data. The face-to-face meetings served as the place to learn, evaluate, discuss and decide upon new steps in the next pilot (Figure 5 below).

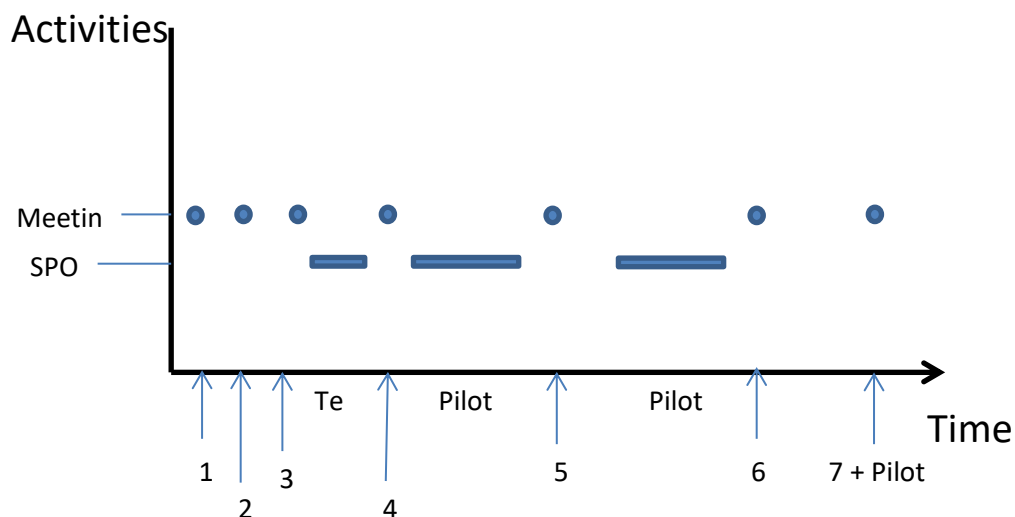


Figure 5. Meetings and SPOD activity

3.4.1.2 EXAMPLE INTERACTION

The example corpus is from Pilot 2 (see below). This pilot spanned a period of six weeks and was done in the Agora in SPOD. After the first pilot, the group decided that open data should be more central to the discussion and they decided upon a goal for the next pilot that was supposed to encourage data use. This goal was to get more insight in the most promising sectors for employment in The Hague. The participants also decided upon a two-phased pilot: the first two weeks were about finding relevant datasets and trying to get access to them. The remaining weeks were supposed to be used to analyse and discuss these datasets to find the promising sectors.

The example corpus is meant to show how using the DG-method gives us insight in activities in SPOD, and can show us about how successful a joint project has been.

	Dialogue transcript (with visualisations)			Joint project		Dialogue game		
Thread	Participant	Time of message	Message	JP name	JP phase	Category	DG-name	Roles
5	AGp	23 May 2016 13:04	I am working on collecting relevant data and make them ready for making datalets, I sent a request to the developers to get access to the CKAN portal, if I have access I will publish them and report it here, let's see if it will work :-)	Pilot 2	IDENTIFICATION	REGULATIVE	CR	Regulator
5.1	JKp	24 May 2016 14:27	Go AG! :)			REGULATIVE	SC	Participant
5.2	AGp	26 May 2016 17:52	Yesss!!!			REGULATIVE	SC	Participant
5.3	RVp	27 May 2016 10:12	AGp is it possible from the data collected to say something about the numbers of job seekers, for each recorded job in the municipality of The Hague and education level. If we have additional information on available vacancies in the sectors with education level we can analyse the data?			INFORMATIVE	OD	OD-requester
5.4	RVp	27 May 2016 16:50	AGp, I had a contact with UWV. I received the following reply: Municipalities can contact for additional data delivery the Bureau of Data Services of UWV: http://www.uwv.nl/zakelijk/gegevensdiensten/welke-gegevens-afnemen/index.aspx can you take this up?			INFORMATIVE	OD	OD-requester
5.4.1	AGp	27 May 2016 17:43	I had a quick look and my conclusion: certain agencies can ask here for information about individuals at the level of benefits etc. This is NOT open data and cannot be used, unfortunately.			INFORMATIVE	OD	OD-provider
5.5	RVp	27 May 2016 17:06	AG, while generally speaking less up to date, the already available open data on the job market from CBS (Central Bureau of Statistics) are a possible alternative: https://www.cbs.nl/nl-nl/onze-diensten/open-data can you do something with this?			INFORMATIVE	OD	OD-requester
5.5.1	AGp	27 May 2016 17:55	Data from CBS are published on the portal <i>data.overheid.nl</i> if I look in the tree view I can find it, apparently they are linked. I only do not know how to access the datasets, will be continued.			INFORMATIVE	OD	OD-provider
5.6	AGp	27 May 2016 17:44	I will explore the CBS data and eventually make them ready for publication on SPOD, indeed they are less up to date as those from UWV			INFORMATIVE	OD	OD-provider

3.4.1.3 ANALYSIS AND DISCUSSION

The central question we try to answer while using the integrated evaluation approach is: to what extent are preferred activities performed on the SPOD during the time period under analysis? The following criteria have been identified to clarify these preferred activities (see §5 of this deliverable). We will only look at the first criteria (focus on open data) for this example corpus, because it is the most relevant aspect of this interaction.

1. Open data focus = dialogue games focused on open data and open data visualisations (e.g., identification or interpretation phase)

The example corpus shows the most common DG of the second pilot; an informative DG focused on finding relevant open data, with an open data requester and open data provider present. After a regulative comment, the discussion folds around possible data/open data and if these datasets are available to the users on the platform. In 5.3 RVp (PA) builds upon already collected and shared datasets in previous threads and asks for additional datasets (educational level job seekers, available vacancies per sector and educational level for these vacancies). He then writes two more messages (5.4 and 5.5) introducing two other data providers that could possibly have relevant datasets, asking specifically if AGp (another PA) can take this up. AGp replies to the questions he is being asked. Even though from the structure of the interactions it looks to be very interactive, when we look at the time stamps we can see that RVp writes his three messages at one point in time and later the same day AGp writes all of his replies.

In this example we can see the different roles of the DG very clearly: RVp asks directly for AGp's help in providing the data and figuring out if other data providers can be used as well. AGp is considered the expert on open data as he is from the department that is responsible for opening up data from the municipality Den Haag. This role distinction is seen throughout the whole pilot. We never see any of the other participants in the role of OD-provider.

Although there is talk of open data in the DG, no actual data is shared. As we see in the replies by AGp, one of the suggestions turns out not to be open data at all, because it is information about individual people (5.4.1), and the other open datasets are not yet accessible through SPOD (5.5.1). The first question by RVp in which several datasets are suggested is however not replied to in that thread.

AGp does not respond to the clearly stated request for open data in message 5.3, not with the data requested or with explanation if this data is available or not. He does reply to the questions about the other data providers, but that does not lead to any datasets shared, only a comment that if he can work it out, the data will be shared (5.6). This does not happen later on. Still, there is a clear interaction about data-related issues in this example corpus, so we do consider it to be an informative DG with two roles present.

But the example leads to some questions that will come up when we analyse all the Joint Projects. Do DG's always have to be successful to be complete? How do we distinguish that and do we have to? Can we see DG's continue in other threads as well and how do we deal with this (e.g., RVp clearly begins with a reference to already collected data that was part of other DG's with other participants)? We think the role of the asynchronous aspect of the pilot needs to be considered when looking at the structure and completeness of the DG's. We will probably see a lot of beginnings of DG, without anyone responding to them (messages get lost in these asynchronous forum style dialogues). But we can possibly also see DG's taken up in another thread at another time.

3.4.2 UNIVERSITY OF UTRECHT (UU, PARTNER 6): EXAMPLE SPOD-TET ANALYSIS

3.4.2.1 BACKGROUND

In the spring of 2016 the Population Decline Challenge took place in Groningen. To prepare for the Population Decline Challenge, two interviews with representatives of population decline citizen's


initiatives were conducted. The interviews focused on identifying two problems or questions that representatives of citizen initiatives in Groningen were facing. In addition, the researchers organized two workshops for which both the two stakeholders and four public administrators experts in the policy field and open data experts were invited. This resulted in two scenarios. One scenario focuses on the Circular Economy in Westerkwartier and one on Health Care in Kloosterburen. During the meetings the scenarios and questions related to the scenario were defined and information needs were identified.

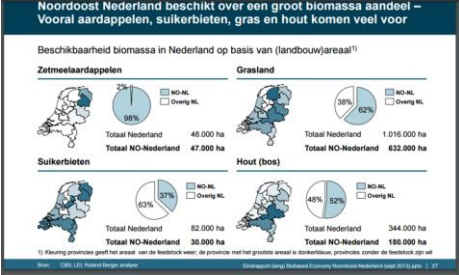
Following, two groups of students were asked to work for five weeks on the ROUTE-TO-PA platforms TET and SPOD. They were asked to further define the problem for their scenario, find relevant open data, interpret the found data, discuss and exchange ideas and find solutions. The role of public administrators and stakeholders of the citizen's initiative during the Challenge was to provide feedback and information, and to deliberate and collaborate with the students. The interactions between the participants took place in the AGORA and Co-creation of SPOD in two different rooms: the Circular Economy and Health Care. The discussions were analyzed based on the Dialogue Games framework. The two scenarios can be considered as two joint projects. With the Dialogue Games the quality of the interaction of the community consisting of public administrators, representatives of citizens' initiatives and students on the ROUTE-TO-PA tools can be assessed.

3.4.2.2 THE ANALYSIS

The two joint projects were coded in line with the definitions of the different Dialogue Games categories: Regulative, Informative, Evaluative and Constructive. Below, illustrations will be provided of both Joint projects. The full analysis of the joint projects can be found in Deliverable 5.2.

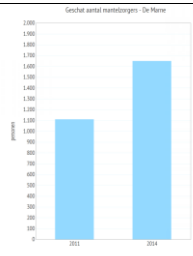
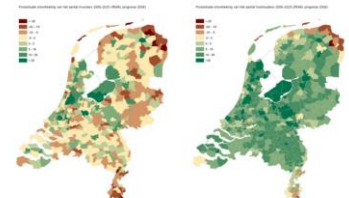
Joint Project Circular Economy WESTERKWARTIER/ Population Decline Challenge Groningen

Line N	Participant	Role	Date	Messages and visualisations			DIALOGUE GAME		
				Thread level 0	Thread level -1	JP phases	Role	Game	
11	Naomi	Student	May 8	Hi Everyone, a little while ago we formulated our research question. How can we make it more specific? Under what circumstances can the Westerkwartier strive for sustainable and innovative food production in the region and at the same time connect it with the region so that employment is stimulated? Anyone suggestions?		PROBLEM-FRAMING	REGULATOR/ SOLUTION COELABORATOR	COLLABORATIVE REGULATION/	CO-ELABORATION
12	Wouter	Student	May 8	I think I found a cool entrance because we focus very much on food production while bio-based in fact concerns the chemical industry. If you read the piece of Mansfeld above. I think we should focus more on biomass and with that you can also centrally collect your biomass and buy a fermenter collectively. The cooperation could have a role in that. Here you can find more information		PRODUCTION	SOLUTION-PROPOSER	CO-Elaboration	
				 <p>Bio-energie wordt opgewekt door verbranding of vergisting van biomassa, bij voorkeur nadat de waardevolle componenten uit deze biomassa hoogwaardig zijn ingezet in voedsel, veevoer, biobased chemicaliën en/of materialen. Wageningen UR doet al tientallen jaren onderzoek naar bio-energie.</p>					
13	Wouter		May 8	Then you would have a question like "under what circumstances can the Westerkwartier use a fermenter to realize a bio-based economy to reduce population decline in the region"			SOLUTION- CO-ELABORATOR		
14	Wouter		May 8	Here is a source regarding biomass in the Northern part of the Netherlands			OD- PROVIDER	CO-INTERPRETATIO	

				<p>Noordoost Nederland beschikt over een groot biomassa aandeel – Vooral aardappelen, suikerbieten, gras en hout komen veel voor</p> 				N
15	Maarten	Stakeholder	May 9	Indeed interesting to take it broader then the bio-based economy. Food, water, energy chemicals etc are closely connected. Next to the above mentioned crops as biomass I would also look into fermentation. The Westerkwartier encompasses many dairy farms and therefore produce a lot of dung. If this can be changed into energy or can be manufactured into materials, it could create employment and independence. With this we can stop population decline			INTERPRETATION PROPOSER	

Joint Project Health Care Kloosterburen

Line	Participant	role	Time	Messages and visualisations		JOINT PROJECT PHASES	Dialogue Game		Space																														
				Thread level 0	Thread level -1		Role	Game																															
2	Evelien	Student	April 19	Table shows that number of elderly increases and number of young people decreases		IDENTIFICATION	OPEN DATA PROVIDER	ARGUMENTATIVE CONSTRUCTIVE	Agora																														
				<div>Perioden ▾ k_65JaarOfOuder_4 ▾ k_0Tot20Jaar_2 ▾</div> <table><tr><td>2014JJ00</td><td>32.1</td><td>31.9</td></tr><tr><td>2015JJ00</td><td>32.8</td><td>31.4</td></tr><tr><td>2016JJ00</td><td>33.4</td><td>31.1</td></tr><tr><td>2017JJ00</td><td>34</td><td>30.6</td></tr><tr><td>2018JJ00</td><td>34.6</td><td>30.2</td></tr><tr><td>2019JJ00</td><td>35.3</td><td>29.8</td></tr><tr><td>2020JJ00</td><td>35.8</td><td>29.4</td></tr><tr><td>2021JJ00</td><td>36.5</td><td>29</td></tr><tr><td>2022JJ00</td><td>37.1</td><td>28.6</td></tr><tr><td>2023JJ00</td><td>37.8</td><td>28.2</td></tr></table>	2014JJ00		32.1		31.9	2015JJ00	32.8	31.4	2016JJ00	33.4	31.1	2017JJ00	34	30.6	2018JJ00	34.6	30.2	2019JJ00	35.3	29.8	2020JJ00	35.8	29.4	2021JJ00	36.5	29	2022JJ00	37.1	28.6	2023JJ00	37.8	28.2			
2014JJ00	32.1	31.9																																					
2015JJ00	32.8	31.4																																					
2016JJ00	33.4	31.1																																					
2017JJ00	34	30.6																																					
2018JJ00	34.6	30.2																																					
2019JJ00	35.3	29.8																																					
2020JJ00	35.8	29.4																																					
2021JJ00	36.5	29																																					
2022JJ00	37.1	28.6																																					
2023JJ00	37.8	28.2																																					
3	Michiel	Student	April		Yet the number of caregivers is	INTERPRETATION	OPPONENT		Agora																														

			21		increasing					
						INTERPRETATION			Agora	
4	Evelien	Student	April 21		Sounds logical if the number of elderly are increasing, there is more demand for caregivers		PROPONENT		Agora	
5	Evelien	Student	April 19	Does anyone have an idea of how to make a line graph with two lines in it? When making a line graph I can only put one variable on the Y-axis		OTHER	HELP REQUESTER	HELPING	Agora	
6	Evelien	Student	April 19	Development of the number of inhabitants and households in the Netherlands in het period 2006 until 2025		IDENTIFICATION	OPEN PROVIDER DATA	Open Data SHARING	Agora	
									Agora	

3.4.2.3 DISCUSSION

The Dialogue Games analysis clearly showed a difference between the two projects. Whereas the Westerkwartier dialogue showed both informative and constructive discussions, the joint project Kloosterburen focused mainly around information.

The first Table above provides an example of a constructive Dialogue Game in the joint project Westerkwartier. The most dominant Games in their discussion are informative and constructive. It can be observed here that after initial collaborative regulation in which a summary is given of the task to be conducted by the participants regarding their joint project the participants start with information sharing in relation to problem framing and identification. Then after two weeks a student initiates thread 11 in which she specifically address the research question formulated by the group and she asks the group to make this question more specific in order to come up with a solution. What follows is that other students are trying to come up with a solution by providing suggestions based on information. The stakeholder also comes in to help the students and provides them with a way to further interpret the question and provides the students with information.

The second Table, immediately above, provides an example of the joint project Kloosterburen. The evaluative argumentation game illustrates the interaction between two students with not firm for or against but more of an exploration. Furthermore an example is provided of someone seeking help and of a student sharing information regarding their joint project.

3.4.3 NATIONAL UNIVERSITY OF IRELAND AT GALWAY (PARTNER 4): EXAMPLE SPOD-TET ANALYSIS

3.4.3.1 BACKGROUND

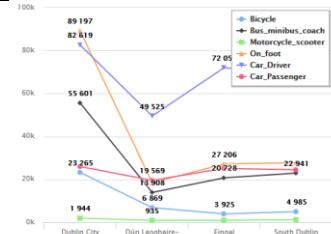
A group of 12 participants engaged in this joint project over the course of 9 days, from October 18th 2016 to October 26th. For the purposes of this exercise, participants were given the following instructions: "Assume you belong to a small group of students living in Dublin and the group is interested in ways of reducing overall traffic flow challenges in Dublin while also thinking about ways to get older adults and disabled people more mobile in the city life. Your group has been looking at relatively cheap and efficient 3-wheeled waterproof scooters that occupy small parking spaces like bicycles. You are considering if making them available in addition to the Dublin Bikes might be a clever way of mobilizing more of the population and reducing overall traffic problems. You were amazed on seeing thousands of mopeds on the city streets in Taipei and wondered about enterprise ideas in this space for Dublin. Your group has chosen to review available datasets in Dublinked to determine how feasible the idea of introducing the three-wheeled moped into Dublin traffic system might seem." In keeping with this scenario, the specific joint project which participants were engaged in here, as can be seen in the extract, was to: Assess the feasibility of mopeds as a means of transport in Dublin City to reduce traffic congestion.

Within this scenario, and the specific joint project in mind, participants were tasked with engaging in a process of dialogue and collaboration which would allow them to consider the relevant factors in determining the feasibility of introducing mopeds as a novel means of transport in Dublin City. During the course of their dialogue, participants considered and discussed a wide-range of factors, including: infrastructural, technical, cultural, and financial factors, among others. In the example provided below, participants discuss modes of travel used by citizens in Dublin City. This discussion is driven by the provision, by one of the participants, of a datalet created from an open dataset in TET. This datalet, which provides a comparison of the frequency of which different modes of transport (by foot, by car - driver, by car - passenger, by bus, by bicycle, by motorcycle or scooter) moves the dialogue forward from a problem-framing phase, characterised primarily by argumentation-constructive dialogue games, to an interpretation phase characterised by co-interpretation of the relevant datalet.

In terms of participation and engagement, this joint project produced a total of 283 individual message overall, with an average of 23 messages per participant, though the range of messages per

participant was considerably large, ranging from 1 to 64. This wide-range in contributions from participants is further highlighted by the fact that 83% of the total number of messages were posted by 5 of the 12 participants. While other participants did not post the same quantity of messages, they may still have been engaged in the dialogue in other ways. 3 of the remaining 7 participants engaged in open-data sharing during the joint project, and a total of 5 participants posted messages on at least 5 of the 9 days. Given that this period included a weekend, this represents a good level of engagement.

3.4.3.1 THE ANALYSIS

Lorraine O'Reilly:	18/10/16 23:09:25	In my experience in a hospital setting, the elderly have embraced the introduction of electronic registration and are more progressive then we give them credit for.	Assess the feasibility of mopeds as a means of transport in Dublin City to reduce traffic congestion	Problem-framing	Evaluative	Argumentation-constructive	Proponent		Agora
Nicola Graham:	18/10/16 23:18:37	I agree.	idem	Problem-framing	Evaluative	Argumentation-constructive	Proponent		Agora
Michael Hogan:	19/10/16 13:33:33	Yes, and any new initiative should undergo some piloting and experimentation and adjustment to ensure it works well for people.	idem	Problem-framing	Evaluative	Argumentation-constructive	Proponent		Agora
Nicola Graham:	19/10/16 15:00:09	Just created this in my space from the 2011 Census Data on Modes of Travel!! It's not really surprising that the largest number of people in Dublin City walk to work, I wouldn't fancy driving into town with that traffic every morning!	idem	Interpretation	Informative	Open data sharing	Open data provider		Agora
Ed Osagie:	19/10/16 15:19:02	This graph looks cool. Understandable!	idem	Interpretation	Informative	Helping	Helped		Agora

Brendan Fahy:		I see from the Central Statistics Office website http://www.cso.ie/en/newsandevents/pressreleases/2012pressreleases/pressreleasecensus2011profile10doortodoor/ that the average time spent travelling to work in 2011 was 26.6 minutes. I wonder is this actually going up.	idem	Identification	Informative	Information sharing	Info-provider	Link to data from the Central Statistics Office on duration of travel time to work	Agora
Gillian Kennedy:	20/10/16 15:44:21	Interesting about Public transport users in Census 2011 Results:- “The number of commuters using public buses fell by 23,277 between 2006 and 2011, a fall of 20 per cent. The number of commuters using a train, DART or Luas rose significantly between 1981 and 2011” Wonder what bus routes made up the 20% drop in commuters using public buses – were the bus routes close to the train, DART or Luas and what distance would they have travelled into the City Centre? I can’t imagine people living too far from the city centre would use mopeds.	idem	Identification	Informative	Information sharing	Info-provider	Link to Public Transport data from the Central Statistics Office	Agora
Ed Osagie:	19/10/16 15:20:46	According to this graph produced by Nicola, (very understandable and quite precise); no surprises that Dublin City has less people on foot and more cars on the street than the rest of 3 members of the Dublin Region. Little wonder about the traffic congestion challenges in Dublin.	idem	Interpretation	Constructive	Co-interpretation	Interpretation-proposer		Agora

Nicola Graham:	19/10/16 15:47:53	I think Dublin City transport department are looking at a new system which will produce better data about traffic flows but it hasn't been implemented yet. But South Dublin have data about journey times across the city.	idem	Interpretation	Constructive	Co-interpretation	Interpretation-elaborator		Agora
Ed Osagie:	19/10/16 16:14:01	I look forward to receiving the data on traffic ponce available. That will be great resource. Perhaps both datasets will complement each other for better understanding	idem	Interpretation	Constructive	Co-interpretation	Interpretation-proposer		Agora
Brendan Fahy:	19/10/16 21:43:28	Dublin City actually is the only region that has more of its population travelling by foot than by car. In Fingal , South Dublin and Dun Laoghaire car is king	idem	Interpretation	Constructive	Co-interpretation	Interpretation-proposer		Agora
Michael Hogan:	20/10/16 12:11:40	It's pretty clear from this graph that, currently, there are not very many people who use mopeds (scooters). The new moped models we've been looking at earlier in our discussion above look very promising. Quite a few people current traveling by bike, which also makes a lot of sense in the city!	idem	Interpretation	Constructive	Co-interpretation	Interpretation-proposer		Agora
Nicola Graham :	19/10/16 20:34:33	Hi everyone, Really interesting points made! If the scooters were to be introduced, do you think we have the right infrastructure? I think improvements would need to be made roads and there aren't really enough cycle lanes. How much funding does the council set aside for road improvements does anyone know?	idem	Problem-framing	Informative	Information sharing	Info-requester		Agora

3.4.3.2 DISCUSSION

The above extract contains dialogue from three phases: problem framing, identification, and interpretation; three categories: evaluative, informative, and constructive; and five dialogue games: argumentation-constructive, open data sharing, helping, co-interpretation, and information sharing. In the beginning of this extract, the dialogue is characterised by problem framing. The focus of the dialogue is on the issue of the usability of these mopeds for the elderly, with one participant suggesting that the elderly are more progressive than they are generally assumed. Some agreement can be seen from two other participants, with one proposing the need for piloting and experimentation. However, without any information or open data sharing, this topic does not develop any further. In contrast, the next topic raised — that of current uptake of other transport options — is catalysed by the posting of a relevant datalet. As a result, the dialogue moves into the interpretation phase. This is the phase in which the majority of the dialogue in this extract takes place, as participants engage in interpretation-proposing and elaborating around an open data visualisation. This datalet (see figure 1. below) which provides information about the frequency with which citizens in different areas of Dublin use different modes of transport, becomes the central focus for participants, allowing them to interpret and discuss data pertinent to the joint project. That is, it helps them to move towards their goal of assessing the feasibility of moped use as a means to reduce traffic congestion in Dublin.

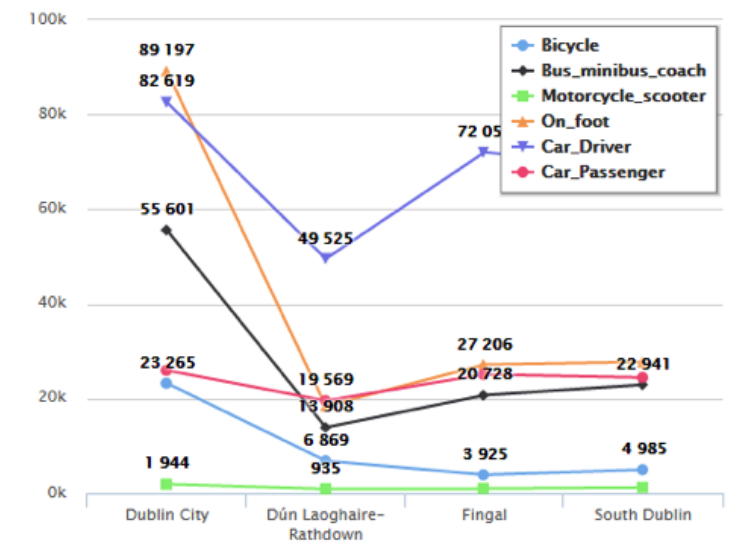


Figure 6. Modes of transport in Dublin

Importantly, participants posted positive messages about the clarity of the datalet (e.g. “very understandable and quite precise” and “it’s pretty clear from the graph that.....”). This clarity, along with the relevance of the specific datalet posted, contributes to the co-interpretation of the visualisation. This extract ends with participants moving on to the topic of infrastructure.

3.4.4 CNRS PARIS (PARTNER 2): EXAMPLE SPOD-TET ANALYSIS

3.4.4.1 BACKGROUND

During the first semester of 2016, two experimental tests were carried out on SPOD in France. They concerned two different populations: PAs from the Paris Region and secondly, Under-graduate students in human sciences from Dijon (next generation of open data users and PAs). Through this approach, we focused on two kinds of open data analysers: civil servants who were not originally trained in the manipulation of open data – and – students who have already exploited and analysed data during their studies.

Three groups were evaluated: two groups of students and one group of PAs. However, due to the embryonic nature of PAs' participation (the GPSO group in Issy-les-Moulineaux had only recently 'seeded' the SPOD with topics/rooms for discussion), we will focus on students' experiments in this document (for explanations, see D5.2).

Student groups comprised seven participants (3 participants and a facilitator in a group, 4 participants in another one). They worked in two different SPOD rooms. They were given the same instructions: imagine that they were parents of two children, who moved from Dijon to the southern edge of Paris (for a new job). In this context, they were asked to find an accommodation near Paris, i.e. in or around Issy-les-Moulineaux, near school institutions (for their children). This main objective can be considered as a joint project.

They had to collectively analyse open data on SPOD for achieving this joint project. They could find open data on SPOD, on official websites of the city of Issy-les-Moulineaux (data.issy.com), Paris Region (data.iledefrance.fr) and government (data.gouv.fr). These platforms gather respectively, 149 datasets (data.issy.com), 600 datasets (data.iledefrance.fr) and 20 000 datasets (data.gouv.fr).

We explicitly specified (in the instruction) that they should collaborate in the discussion space for designing the most efficient solution to the (difficult) problem (find suitable accommodation in Paris Region). They worked during one hour (-/+ 15 minutes) on the Agora.

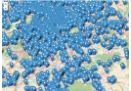

This experiment, thus allowed, to study one of the most active populations of open data users (*digital natives*) which is generally engaged in associative life and/or worked in digital start-up companies (the most important open data consumers).

3.4.4.2 THE ANALYSIS

Interactions on SPOD were coded according to the Joint Projects-Dialogue Games framework. Thus, four categories of dialogue games were considered: Regulative, Informative, Evaluative and Constructive. They were analyzed in the light of the different phases that compose a joint project, i.e.: problem-framing, identification, interpretation and production.

We present here, one of the most representative samples of Dialogue Games - in one room for one group. For a complete evaluation of all such interactions, please see Deliverable D 5.2

Line references	Dialogue transcript (with visualisations)			Joint Projects		Dialogue games		
	Participant	Time of message	message	JP name	JP phases	Category	DG-name	Roles
Line 1	julien :	01-April-2016 , 17:15:26	Hello [In English in the original]	Find a place for living	other	Regulative	Social Interaction management	regulator
Line 2	julien :	01-April-2016 , 17:16:18	I propose that we analyse the problem before beginning?	Find a place for living	problem-framing	Regulative	Collaborative Task Regulation	regulator
Line 3	julien :	01-April-2016 , 17:16:32	Ok for you?	Find a place for living	problem-framing	Regulative	Collaborative Task Regulation	regulator
Line 4	Alexandra Simao :	01-April-2016 , 17:17:41	Good for me	Find a place for living	problem-framing	Regulative	Collaborative Task Regulation	participant
Line 5	julien :	01-April-2016 , 17:18:03	We have to find a town, with a college, a lycée school and transports	Find a place for living	problem-framing	Regulative	Collaborative Task Regulation	regulator

.....								
Line 13	Alexandra Simao :	01-April-2016 , 17:25:26	I created a map for the colleges and lycées in Ile de France	Find a place for living	identification	INFORMATIVE	IS	Info Provider
Line 14				Find a place for living	identification	INFORMATIVE	Open Data Sharing (ODS)	OD Provider
.....								
Line 18	Alexandra Simao :	01-April-2016 , 17:30:39	Therefore, two maps	Find a place for living	identification	INFORMATIVE	IS	Info Provider
Line 19	Alexandra Simao :	01-April-2016 , 17:32:43	Here is the map of colleges in IDF	Find a place for living	identification	INFORMATIVE	is	Info Provider
Line 20				Find a place for living	identification	INFORMATIVE	Open Data Sharing (ODS)	OD Provider
Line 21	julien :	01-April-2016 , 17:32:55	I'll do the primary schools	Find a place for living	identification	INFORMATIVE	IS	info Provider
Line 22	julien :	01-April-2016 , 17:39:25	The primary schools	Find a place for living	identification	INFORMATIVE	IS	info Provider
Line 23				Find a place for living	identification	INFORMATIVE	Open Data Sharing (ODS)	OD Provider
Line 24	julien :	01-April-2016 , 17:40:34	saint mandé or vincennes, we should study the transportation	Find a place for living	identification	Regulative	Collaborative Task Regulation	regulator
Line 25	Alexandra Simao :	01-April-2016 , 17:41:06	Me, il wanted to propose Neuilly sur Marne	Find a place for living	production	constructive	(Co-)interpretation	Interpretation-proposer
Line 26	Alexandra Simao :	01-April-2016 , 17:41:27	Because the price per m² is affordable in comparison with other places	Find a place for living	production	constructive	(Co-)interpretation	Interpretation-proposer
Line 27	Alexandra Simao :	01-April-2016 , 17:46:12	There you are	Find a place for living	production	constructive	(Co-)interpretation	Interpretation-proposer
.....								
Line 34	julien :	01-April-2016 , 17:55:26	issy les moulineaux ?	Find a place for living	production	constructive	(Co-)elaboration	Solution-proposer

Line 35	Alexandra Simao :	01-April-2016 , 17:55:36	Issy les Moulineaux ?	Find a place for living	production	constructive	(Co-)elaboration	Solution-proposer
Line 36	Clémentine :	01-April-2016 , 17:56:43	I rather agree	Find a place for living	production	constructive	(Co-)elaboration	Solution-co-elaborator
Line 37	Alexandra Simao :	01-April-2016 , 17:57:24	Because of the level of free access cars, there are quite a few of them, there are colleges and lycées and the price per m ² is more affordable in comparison with Boulogn	Find a place for living	production	constructive	(Co-)elaboration	Solution-co-elaborator

3.4.4.3 DISCUSSION

The present analysis shows that identification and production appear as the most prevalent phases – and – informative and constructive Dialogue Games represent the largest portion of the discussion.

Thus, the example SPOD-TET interaction shown above brings to light three principal results that we will discuss below.

- Firstly participants quickly engaged in data search and in the visualisation design.
- Secondly, they used graphical representations to debate and argue.
- Thirdly, they found a mutual agreement in a short period of time after analysing data.

In the first instance, they began by reframing the problem in terms of task and subtasks.

Line 5 [Julien, 17:18] *“We have to find a town, with a college, a lycee school and transports”*

Then each participant engaged in the achievement of these subtasks by proposing data visualisations.

Line 13 [Alexandra Simao, 17:25] *“I created a map for the colleges and lycées in Ile de France”*

As such, all participants created visualisations but they intervened in the discussion at various levels. Certain students settled for submitting visualisations and partial comments. Others were involved actively and continuously in the different Dialogues Games. However, whatever their roles, they interacted together for exchanging (i) their individual understanding of the instruction, (ii) their approach of the issue and (iii) their data interpretation. And, when they argued (e.g. for defending their approach or their interpretation), they did not only based on their own information sources and/or data analyses, but they also relied on the works carried out by their peers. In this way, they found an agreement in a short time-span.

In conclusion, the results demonstrate that data were involved in the discussion, at a very early stage of the Dialogue Games and that they had a central position. They also suggest that data analyses and solution design were based on strong and intense interactions between participants.

In sum, the outcomes indicate that students quickly familiarized with the system (SPOD) and the resource (open data), triggering an actively discussion that swiftly reach to a unanimous consent on the issue.

3.5 SUMMARY: COMMUNITY LEVEL MODEL AND ANALYSIS METHOD

The Joint Project-Dialogue Game (JPDG) analysis method described above allows us to understand what participants in SPOD-TET mediated online epistemic communities are trying to achieve, and how they engage in dialogue, on and around open data visualisations, in order to do so. Within joint

projects and dialogue games, as we categorise them, we are thus able to understand the proportions of their activities that are focussed on open data visualisations, on co-elaborating meanings for them in relation to their goals, and the roles that specific participants play in this process.

The diversity of example analyses presented above, of real SPOD-TET interactions, enable us to conclude that the model has a sufficient degree of **coverage** of the data, when viewed in relation to full analyses presented in D5.2.

The examples are taken from the SPOD AGORA space, involving discussions on and around open data visualisations. But the model also applies to collective work in the CO-CREATION ROOM. However, in this case, a more detailed trace of the activity is required for analysis, as actions are distributed across different tools (e.g. common text, chat) is required, that reconstructs their sequentiality.

Of course, as we mentioned in introduction to this section, not all action on the SPOD-TET actually involves collaboration and therefore genuine dialogue games. Some ‘discussions’ may in fact be lists of individual messages or actions, with no evidence of uptake or replies by others. These can be seen as ‘unsatisfied’ or incomplete dialogue games, or even bids for opening them, that have not yet achieved dialogue. Therefore, a first level of analysis involves separating the messages/visualisations into two categories: those involving collaboration and dialogue games, and those that do not involve this.

In several example analyses shown above, the institutionalised role of the moderator appears to be crucial. Further work on guidelines for moderators will be carried out in year 3 of the project.

4 USABILITY, TECHNOLOGY AND USER LEVEL EVALUATION: APPROACH AND EVALUATION TOOL

During year 2 of the ROUTE-TO-PA project, advances were made on defining an overall approach to **evaluating usability**, on the part of individual users of SPOD-TET tools. Given this particular focus on **individuals’ representations** — of the extent to which the tools enable them to achieve their goals — this work, carried out during year 2, also contributes to the individual-level model to be elaborated during year 3 of the project (Task 3.3).

The questionnaire that was defined for usability is reproduced in **Appendix 2** at the end of this document.

Below, we describe the conceptual framework for the usability, technology-level and user level evaluation of the Route-To-PA tools (SPOD-TET). We understand the term usability of a software (or system) to be a set of quality attributes related to the efforts associated with use of the software and the *individual assessment* of such use, by a stated or implied set of users. Usability is also related to the extent to which a software system can be used by a specified user to achieve specified goals with effectiveness, efficiency and satisfaction in a specified context of use. For the technology-level evaluation, we focus on the perceived affordances of the tools with respect to monitoring, deliberating and participating in government activities using open data. The user-level evaluation examines how the use of the tools impacts on the agency of the users regarding the ability to monitor, deliberate and participate in public administration activities and decision processes. The notion of user agency here includes attributes such as competence or possession of both discursive and practical knowledge, reflexivity and different kinds of needs including existential, relatedness and growth (Ojo et al. 2013).

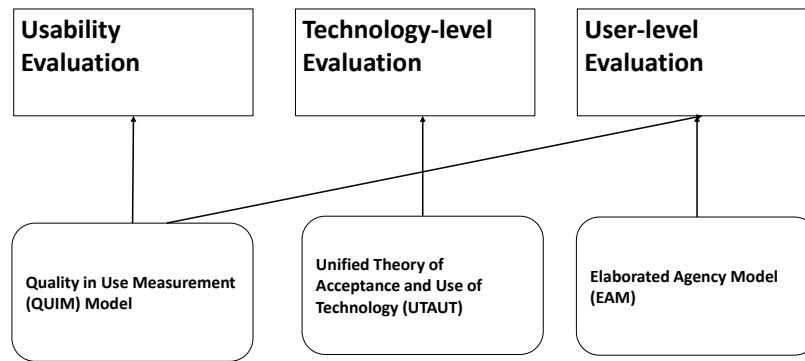


Figure 7: Theoretical Framework for Usability, Technology and User-level Evaluation

Three models were identified as a foundation for constructing the evaluation framework and instruments such as questionnaires and protocols for interviews and focus groups. The first model is the Quality in Use Integrated Measurement (QUIM) model (Seffah et al. 2006). QUIM consolidates various usability models into a single hierarchical model comprising 10 usability factors and 26 sub-factors or criteria. The second model is the Unified Theory of Acceptance and Use of Technology (UTAUT); a consolidation of several User Acceptance models (Venkatesh et al. 2003). The third model developed in (Ojo et al. 2013) is based on the notion of agency expounded in (Giddens 1984) and the notion of needs developed as part of the Choice Framework in (Kleine 2009). The integrated use of the three models is shown in Figure 1 and elaborated in the sections below.

4.1 USABILITY EVALUATION

The Quality in Use Integrated Measurement (QUIM) model consolidates usability models from different domains including Human Computer Interaction (HIC), Standards and Software Quality. QUIM is a hierarchical model that decomposes usability into a set of factors, related criteria and associated metrics (Seffah et al. 2006). As a framework, QUIM enables the derivation of specific usability models and measurements that are most suited for a specific usability scenario. The usability factors captured by the QUIM model include: efficiency, effectiveness, productivity, satisfaction, learnability, safety, trustfulness, accessibility, universality and usefulness. After the analysis of the usability scenario for Route-To-PA tools, only four factors were considered relevant. These factors are: effectiveness, satisfaction, learnability and accessibility. Regarding specific usability criteria, of the 26 criteria provided in QUIM, only five were found relevant for the usability and user-level evaluation of Route-To-PA tools. The reduced QUIM framework adopted is depicted in Table 10.

Table 10: QUIM Framework for Evaluating Route-To-PA tools

Usability Criteria	Usability Factors				Example of Scales employed in Instrument
	Effectiveness	Satisfaction	Learnability	Accessibility	
Minimal action		●	●	●	The number of steps to create a data visualisation are few
Self-descriptiveness			●	●	The buttons and controls on the platform are self-descriptive and intuitive
Accuracy	●				The datasets retrieved using the keyword search are relevant
Readability				●	Search results, data tables and charts are clear and easy to read
Simplicity			●	●	The search results, data tables and charts are simple and understandable

4.2 TECHNOLOGY-LEVEL EVALUATION

The objective of the technology-level evaluation is to establish the likelihood of the intention to use and subsequently use the Route-to-PA tools for monitoring of local authorities activities, deliberating with other users over societal issues of mutual interest, and participating in co-creating solutions with other users and local authorities. For this evaluation, we employ the Unified Theory of Acceptance and Use of Technology (UTAUT). The theory is an empirically-based consolidation of eight major models of user acceptance of technology (Venkatesh et al. 2003). UTAUT identifies three factors influencing behavioural intention to use a technology, with behavioural intention and facilitating conditions in turn directly influencing the actual use of technology. Also, gender, age, experience and voluntariness are assumed to mediate the influence of all four factors (see Figure 8).

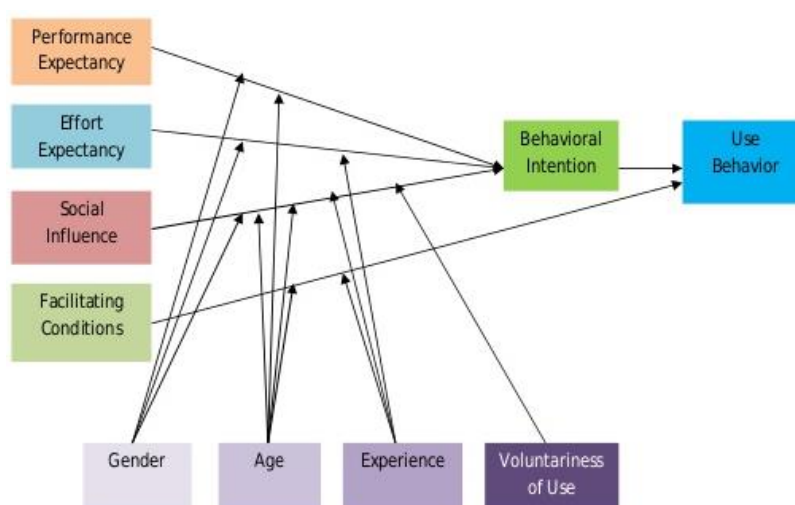


Figure 8: UTAUT Model⁵

⁵ Source of image - <https://www.linkedin.com/pulse/unified-theory-acceptance-use-technology-utaut-ayman-alqudah>

In the context of the Route-To-Pa technology evaluation, two of the UTAUT factors were deemed relevant, specifically, Performance Expectancy and Effort Expectancy. These factors are described in Table 11 with examples of scale items used in the resulting instrument. Given that Route-To-PA tools could be employed by users for monitoring, deliberation and participation goals, scale items were generated for each goal type in the resulting instrument and are grouped correspondingly into three categories.

Table 11: UTAUT Factors for Technology-level Evaluation of Route-To-PA tools

UTAUT Factor	Description	Example of scales
Performance Expectancy	The degree to which an individual believes that using the system will help attain gains in job performance.	The tool enables me understand the data that the local authority has published The tool helps me collaborate and coordinate with others to achieve our co-creation goals
Effort Expectancy	The degree of ease associated with the use of the system.	Using the data visualisation tools, I can quickly see if the dataset is of good quality

4.3 USER-LEVEL EVALUATION

The objective of the user-level evaluation is to examine the degree to which the use of the Route-to-PA tools impacts on the agency of the users to monitor local government activities, deliberate with others to address societal challenges and participate in the co-creation of solutions with the local government. The effect or impact of the use of Route-To-PA tool is conceptualised in the user-level evaluation as a positive change in the agency of the user. Based on the elaborated agency model in (Ojo et al. 2013), such positive change in user agency will be reflected by increased knowledge (both discursive and practical), higher reflexivity and attainment of essential user needs. User needs, in general, are classified as existential, relatedness and growth related. In the context of the Route-To-PA user-level evaluation, we find all three factors - knowledge, reflexivity, and needs – relevant to the scenarios of use. In relation to the needs factor in particular, we consider relatedness and growth only as relevant. These factors are described in Table 3 along with examples of the scale items employed in the questionnaire.

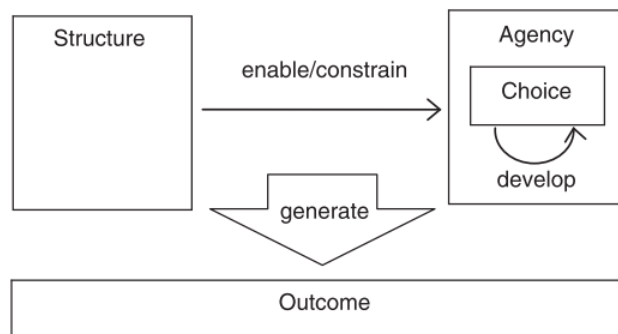


Figure 9: Elaborated Agency Model (Ojo et al. 2013)

Table 12: Elaborated Agency Model for User-level Evaluation of Route-To-PA tools

EAM	Description	Example of scale items
Knowledge	The degree to which the tool enhances the understanding and knowledge of the user	I can understand government data and activities relevant to my concern
Reflexivity	The degree to which the tool enables the user to critically evaluate the data published relative to their own interest	I am more aware than before about local government data and activity relevant to my concern
Needs Relatedness –	The degree to which tool enables the user to build social relationships with others to achieve some goals	Access to open data through the tool makes me more involved in group affairs relevant to my concern Being involved in deliberation over data offers me better sense of connection with other members of staff
Needs - Growth	The degree to which the tool enables the user to access information resources for their own benefit	I am able to access data/information published by local government relevant to my concern. I feel empowered to be involved with others in deliberation over open data relevant to my concerns

5 INTEGRATED ANALYSIS AND EVALUATION MODEL

In this section we describe how the contributions of the Societal Model (year 1), the Community-Level Model and Technological Usability Model (year 2) are integrated to give rise to an integrated set of evaluation questions, with the methodological tools that enable them to be answered. We also prefigure and integrate Workpackage 3, year 3 work on the individual representations model.

5.1 MODEL INTEGRATION

Within Workpackage 3, the ROUTE-TO-PA project elaborates three models and associated analysis methods: societal (year 1), community (year 2) and individual-representations (year 3). As described below, to this we also add a Technological Usability ‘layer’, based on the work developed in §4, above. A first level of integration is based on the identification of relations between certain elements of each model, as shown in **Figure 10**, below:

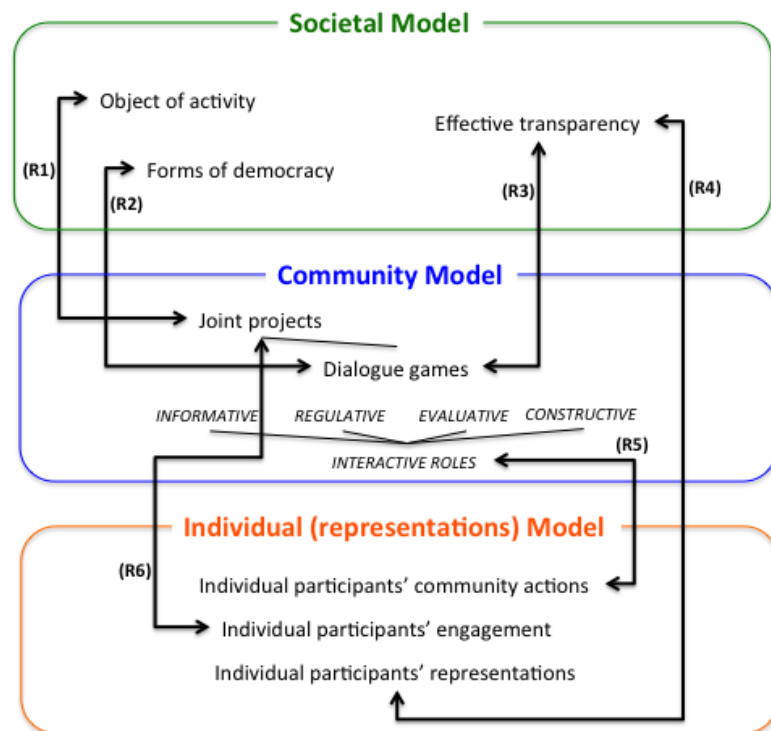


Figure 10. Relations between model elements.

Details of these model element relations, shown in **Figure 10** above, are as follows:

- R1: At the societal level, in terms of the Activity Theory approach, the **object** of activity corresponds to the very high level or basic need that the activity fulfils (e.g. earning money in order to sustain life, or, maintaining an effective organisation in a democratic society, etc.). At the community level, this 'translates' into one or more specific **goals** that a **joint project** will attempt to achieve (e.g. finding and understanding open data relevant to developing an enterprise, to finding democratic solutions to population decline, etc.).
- R2: At the societal level, specific forms of democracy will relate to a predominance of particular dialogue games. Thus, participatory democracy would involve CONSTRUCTIVE dialogue games (with respect to, for example, policy), whilst deliberative democracy would favour deliberative/constructive games and monitorial democracy, evaluative and informative (asking questions about policy), as discussed in §3 above.
- R3: In terms of *effective* transparency (see §2 above), joint projects at the online community level would mostly relate to CONSTRUCTIVE dialogue games, in which participants transform open data visualisations into understanding and knowledge.
- R4: At the level of individuals' representations, these are studied in terms of how SPOD-TET community participants understand the degree of transparency (nominal, effective) of their relations with Public Administrations.
- R5: The analysis of interactive roles at the community level — i.e. evolving regularities in how they intervene in communities — is one aspect of the focus on individual participants.
- R6: degree of engagement in Joint Projects involving open data.

Beyond these partial relations between model elements, we distinguish two concepts and their corresponding phenomena, that can be considered 'vertically' across the three models, as well as the Technological Usability layer, i.e. **transparency** and **engagement** (see §2 of this deliverable, above), as shown in Figure 11 below:

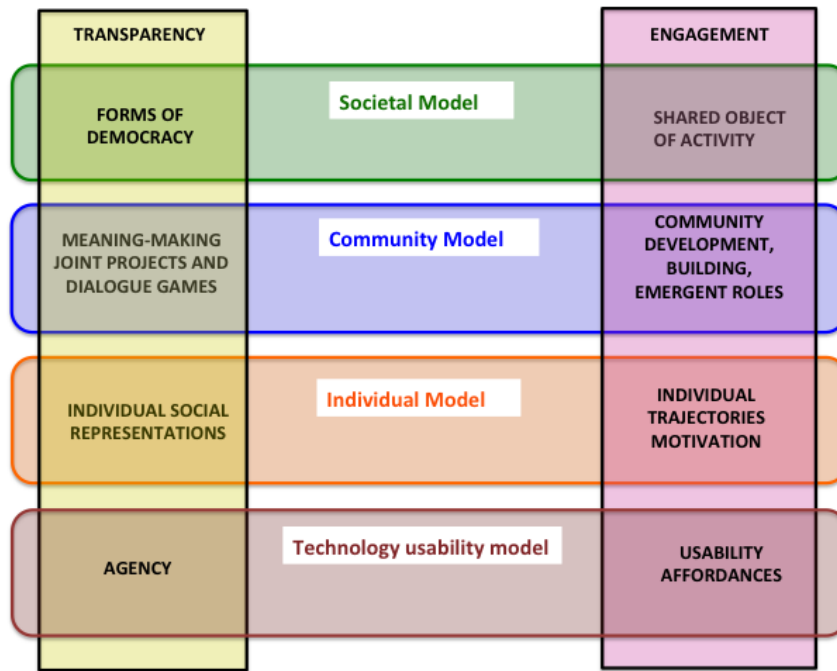


Figure 11. 'Vertical' conceptual integration: transparency and engagement, across models.

Thus,

- **Transparency** can be understood:

- at the societal and organisational level in terms of forms of democracy that promote organisational structures for data policy transparency;
- at the community level in terms of dialogue games enacting effective transparency (meaning-making);
- at the individual level in terms of participants' social representations of the transparency of their interactions with PAs;
- at the Technology Usability level, in terms of degree of agency (see §4 above) of SPOD-TET users.

- **Engagement** can be understood:

- at the Societal Level, as relating to the possibility that PAs and specific social groups (as defined by scenarios: cf. Workpackage 2) co-elaborate shared objects of activity (in other terms, that they find a common interest in further elaborating nominal and effective transparency with respect to open data);
- at the Community Level, in terms of growth, development of online epistemic communities, that move towards greater 'communityness' in terms of structuration by emergent roles;
- at the Individual Level, in terms of evolving trajectories of individuals, throughout community development;
- at the Technology Usability level, in terms of usability and technology affordances.

In summary, we have achieved integration of models on a conceptual level, focussing on two key 'vertical' concepts for the project: transparency and engagement. Such an integration has been achieved on the basis of a considerable and novel interdisciplinary effort, in management, political, organisation, psychological, linguistic and computer sciences.

In the next subsection, we explain how these integrated concepts and models enable us to define and answer a redefined set of common evaluation questions, in relation to the ROUTE-TO-PA project's goals.

5.2 PROJECT GOALS, EVALUATION QUESTIONS AND METHODOLOGICAL TOOLS

Our aim here is to develop a unified approach that enables us **to evaluate the extent to which the ROUTE-TO-PA project's goals have been attained**, throughout the project's duration. The term **"success criterion"** refers to the extent to which these goals have been achieved.

Given differences in scale, organisation, usage scenarios and implemented forms of democracy in Public Administration partners in the project, the extent to which a degree of achievement of goals, a success criterion, is deemed to be satisfactory is relative to these factors.

In order to define the integrated evaluation approach, a more operational definition of project goals has been elaborated, as follows:

ROUTE-TO-PA project goals: operational definition

The goal of the ROUTE-TO-PA project is
to enhance transparency
in relations between and within Public Administrations and specific stakeholder groups
by elaborating specific tools — SPOD/TET —
that support the emergence of veritable Online Epistemic Communities
focussed on understanding, using and co-creating Open Data (Visualisations),
thereby achieving positive impact
on the levels of organisations, stakeholder communities and their aims.

The project goal, divided into elements as above, translates into **questions for evaluation** (i.e. to what extent have these goals been achieved?), to which models and methods respond.

The relations between project goals and evaluation questions are depicted in Figure 12, below. Their definition is based on:

- The societal model
- The community model
- A partial anticipation of the year 3 individuals' representations model
- Technology Usability model
- Public Administrations' success criteria (essentially, growing numbers of online participants and enhanced usability: see **Appendix 3**).

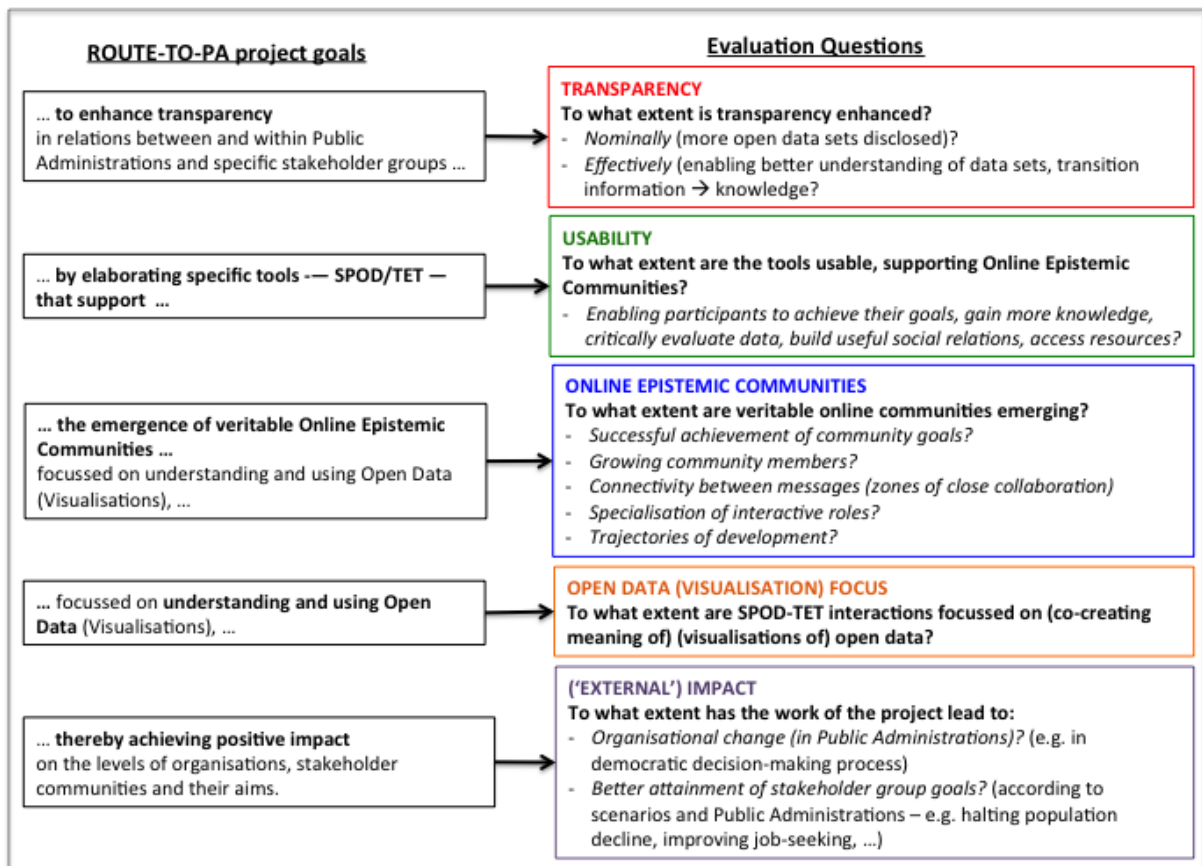


Figure 12. Relations between project goals and evaluation questions.

In **Figure 13** below, now that groups of evaluation questions have been defined in accordance with project goals, we present the way in which specific models and analytical tools or methods enable us to reply to these questions (**the questions are re-ordered in this case**, according to their relations to models, rather than their order of appearance in the project goal statement).

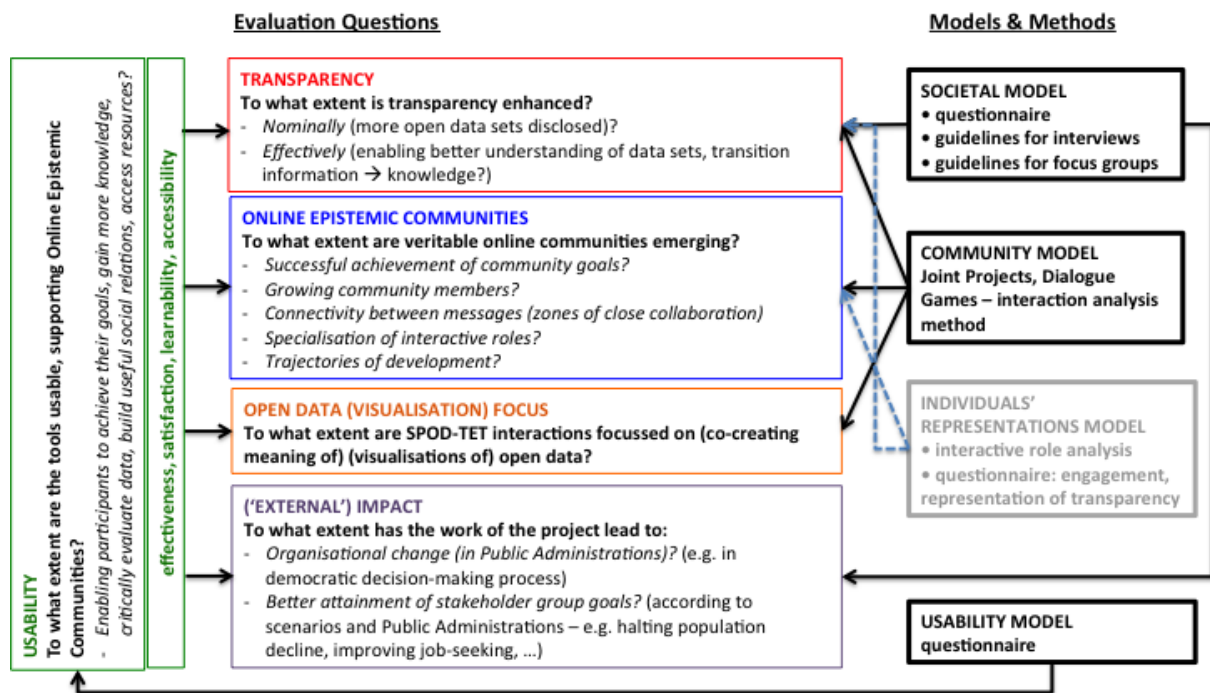


Figure 13. Evaluation questions, models and methods

In **Figure 13**, above (*Evaluation questions, models and methods*),

- The Societal Model provides operational definitions of nominal transparency (evaluated by interviews with Public Administrations) and of effective transparency, the latter being evaluated by the community model (dialogue games involving co-construction of meaning of open data).
- The Community Model provides a method for analysing joint projects and dialogue games in the Online Epistemic Communities, supported by SPOD/TET, including the extent to which interactions are focussed on open data (visualisations).
- The Individuals’ representations model (to be elaborated in Year 3) draws on Societal model definitions of transparency in order to design questionnaires and interviews to understand subjective representations of this. It is also partially addressed on the behavioural/actional level, by identifying participants’ interactive roles and trajectories, in terms of the Community Model.
- The Usability Model assesses, with a questionnaire, the extent to which participants on SPOD/TET see the tools as enabling them to achieve their goals, involving use of open data of Public Administrations.

The relevance of specific questions in the integrated evaluation model depends on the specific stage of advancement of work in the project. For example, towards the end of year 2, questions concerning development over time of online epistemic communities are less relevant given that SPOD/TET supported communities had only recently begun to emerge: these questions will be addressed in Year 3 of the project. Similarly, ‘external’ impact assessment is more relevant towards the end of the project.

Depending on partners’ specific associated Public Administrations, particular questions may be deepened (e.g. relating to external impact), on the basis of research presented in other sections of this document.

Results of evaluation of the quality of SPOD/TET interactions that had been produced on country-specific platforms towards the end of year 2 are reported in D5.2, according to the following questions (Table 13), taken from those defined in the integrated evaluation model:

Table 13. Year 2 SPOD/TET interaction evaluation questions

(colours used mirror those of Figure 13, above):

Evaluation Question 1: Open Data (visualisation) focus	To what extent are the SPOD/TET interactions focussed on discussion of open data visualisations (according to the main Phases of Joint Projects, defined in the Community Model)?
Evaluation Question 2: Online Epistemic Communities (goal achievement)	To what extent are the dialogue games successful, from the participants' points of view, in achieving their aims (e.g. co-constructing an idea, making a decision, etc.), in relation to the Joint Projects with respect to which they were generated?
Evaluation Question 3: Transparency	To what extent do the SPOD/TET interactions show effective transparency, according to the dialogue game model, i.e. co-construction of meaning for the open data (visualisations)?
Evaluation Question 4: Online Epistemic Communities (community evolution)	To what extent are the interactions on SPOD/TET moving towards veritable online epistemic communities, involving collaboration (rather than unanswered isolated messages), specialisation of interactive roles and growth in participation?
Evaluation Question 5: Usability	According to usability questionnaire results, from individual participants' points of view, to what degree do the SPOD/TET tools enhance their understanding of open data, enable them to build social relationships, and access information that enables them to achieve their goals (joint projects)?

Answers to the evaluation questions at the community model level draw on the transformation (in tables) of qualitative analysis into quantitative data (frequencies of messages in dialogue games, main roles, etc.).

5.3 SYNTHESIS OF RESULTS OF THE APPLICATION OF THE COMMUNITY LEVEL ANALYSIS METHOD TO FULL YEAR 2 CORPORA

5.3.1 OVERVIEW

In order to give a complete picture for readers of this document (D3.2), of the development and application cycle of the dialogue game analysis method, a short synthesis is presented here, of the results of applying the method to full interaction corpora. For a complete presentation of these results, the reader is referred to D5.2(b) of the ROUTE-TO-PA project, and to its Appendix (D5.2(c)) for the full evidence-base of this work (i.e. the interaction corpora with their analyses).

Table 14, below, shows the main characteristics of partners' SPOD-TET interaction corpora that were analysed in year 2 of the project, using the above-described dialogue-game analysis method.

Table 14. Main characteristics of partners' SPOD-TET interaction corpora

City	Discussion topic	Participants (type, N)	N msg.	N viz./data	Mean N messages per 1 viz./data	Mean N messages per participant
Prato	Where to put wifi hotspots to best cover the city	Citizens, PAs of Prato (N=11)	63	6	10.50	5.73
Groningen	1. Healthcare	(N=8)	28	5	5.60	3.50
	Kloosertburen	(N=5)	46	17	2.70	9.20
	2. Economy Westrkwartier					
Issy-les-Moulineaux	Which of two towns in Paris region is best to live in	University students (N=4)	47	6	7.83	11.75
Den Haag	How to improve employment in Den Haag (2 discussions)	PAs and employers (N=7; N=8)	33	5	6.60	4.71
			56	10	5.60	7.00
Dublin	Viability of alternative modes of transport (e.g. rent-a-moped)	Researchers, PAs (N=13)	293	7	41.86	22.54

From the above Table 14 it can already be seen that The number of messages per data set or visualisation imported into SPOD varied, according to the nature of the discussion, between 2.7 and 41.86, and that this relates to the average number of messages per participant (the higher the number of participants, the less messages they each produce, on average). We can see here a basic difference between more loosely coupled interactions involving many participants (in the case of Prato) and smaller more focussed group activity (Groningen/Economy Westrkwartier). This basic data will be returned to below, with respect to evaluation questions.

Once participants' interaction corpora had been coded using the dialogue game and joint project categories, these *descriptive* analyses were used as a basis for answering the *normative* evaluation questions derived and presented in the previous section (§5.2) of this document (Table 13) **that were relevant in Year 2**. As explained above, question 4 (see below) is not relevant in year 2 for all partners, given that emergence of online communities was in an embryonic state. Similarly, usability was assessed for the interface as a whole, in Galway, and is reported in D4.2; it will become more important in year 3 of the project. Therefore, the four questions below were retained for year 2.

We therefore summarise below, over all partner corpora, the main answers provided to these questions (again, **see D5.2(b) and D5.2(c) for details of analyses and full interaction corpora**).

5.3.2 EVALUATION QUESTION 1: OPEN DATA (VISUALISATION) FOCUS

"To what extent are the SPOD/TET interactions focussed on discussion of open data visualisations (according to the main Phases of Joint Projects, defined in the Community Model)?"

Table 14, below, summarises the responses to this question, across partners. Within the timeframe of D3.2 (submitted in January 2017), it was not possible to fully analyse the Prato data, which was produced from the end of November 2016 onwards into January 2017. Results for Prato are therefore preliminary.

Table 14. Main responses across partners (Open Data visualisation focus)

City	Open data focus (summary)
Prato	Most open data visualisations were introduced by the PA moderator; few datasets were consulted or referred to by citizen participants.
Groningen	At the time the challenge was organised, there were not many relevant open data sets that could be consulted, therefore most consulted datasets were outside SPOD-TET. Most dialogue games were informative, drawing on open data visualisations.
Issy-les-Moulineaux	Participants selected relevant data. Collaborative solutions elaborated were clearly based on the open data visualisations that had been imported into SPOD.
Den Haag	There was a clear evolution across the two discussions, the first not involving open data visualisations at all (this was general framing of the problem) whereas the second discussion was completely focussed on open data.
Dublin	In total, 19% of messages focussed directly on open data visualisations, involving dialogue games aiming to interpret these visualisations. The largest proportion (48%) of the dialogue was focussed on problem framing.

Overall, the focus of discussions on open data visualisation depended on the nature of the task and the type/number of participants. In the case of Groningen, Dublin and Den Haag, the initial part of the discussions was devoted to problem framing, trying to mutually understand, what the shared problem was, and did not involve open data consultation. In the case of open consultations with a large number of citizen participants responding to a general open question, citizens were not led spontaneously to use open data visualisations, these being introduced by PA moderators. However, in cases where there was a well-defined shared task and a relatively small group of participants (e.g. Issy-les-Moulineaux, Groningen), interactions were essentially based on determining the most adapted database for solving the issue regarding available metadata. They were focused on negotiating meaning for open data visualisations in order to achieve that well-defined task (often pre-defined by the researcher).

We conclude that open data visualisation focus of discussions depends greatly on the clear definition (either pre-defined, or else negotiated at length at the beginning of the discussion) of a shared task, or problem to be solved and on the nature of metadata associated with accessible datasets.

5.3.3 EVALUATION QUESTION 2: ONLINE EPISTEMIC COMMUNITIES (GOAL ACHIEVEMENT)

“To what extent are the dialogue games successful, from the participants’ points of view, in achieving their aims (e.g. co-constructing an idea, making a decision, etc.), in relation to the Joint Projects with respect to which they were generated?”

Discussions were evaluated as successful in terms of participants’ explicit statements concerning this and/or to the extent that the goal of the interaction (e.g. deciding on new forms of transport, proposing new wifi spots, choosing which town to live in, etc.) was achieved, as evidenced in the dialogue itself and/or in a subsequently written report (Groningen). (In)satisfaction with the dialogue is also relevant here (e.g. frequency of ‘gripping’ dialogue games).

Table 15. Main responses across partners (goal achievement of online epistemic communities)

City	Goal achievement (summary)
Prato	18 new wifi spots were proposed by citizens, who gave reasons in favour of their suggestions, but did not engage in interaction with each other.
Groningen	Dialogue games were mostly informative, which indicates a degree of achievement of the goal of being better informed about the issue. There was a small amount of griping about the tools. In their written reports produced after the discussion, participants explicitly stated that the discussion was successful in the sense that it revealed the lacunæ in open data relevant to the issue at hand.
Issy-les-Moulineaux	Participants reached shared solutions to the problem (deciding which town to live in) in discussions closely focussed on the problem, using open data visualisations. The joint project was clearly successful from the participants' points of view.
Den Haag	Participants spent most effort in trying to define their problem, and therefore did not come to a clear shared solution. Another problem was a lack of regulation of the discussion.
Dublin	The most frequent dialogue games were argumentative-constructive (28%). Although some participants explicitly stated that they felt better informed about the question (alternative transport in Dublin) after the discussion, no clear joint solution was reached at the end of the dialogue. Some of the success may have been compromised by technical issues (12% of messages were 'griping').

Overall, we can see here that the success of a discussion — from the participants' point of view, in terms of goal achievement — depends crucially on the definition of a clear joint project, shared problem or scenario. Participants need effective guidance on what can be achieved using open data visualisations, in a more tightly knit group, using SPOD-TET. Clearly, usability of the tools is an issue, in some cases. An interesting outcome, 'successful' from the participants' point of view, was the discovery of the limits of the available open data for solving their problem (Groningen).

5.3.4 EVALUATION QUESTION 3: TRANSPARENCY

"To what extent do the SPOD/TET interactions show effective transparency, according to the dialogue game model, i.e. co-construction of meaning for the open data (visualisations)?"

Recall that *nominal transparency* is the provision of open data; *effective transparency* involves enabling interactions on or around open data/visualisations in order to promote a deeper co-constructed understanding of them. Several dialogue games involve this process, in particular the constructive-argumentative game. Table 16, below, summarises results across partners.

Table 16. Main responses across partners (effective transparency)

City	Effective transparency (summary)
Prato	Although citizens argued for their suggestions (new wifi spots), there was no discussion amongst them concerning open data, and no manifest joint meaning-making. The corpus consists essentially of individual largely unrelated contributions.
Groningen	A lack of nominal transparency (lack of relevant data sets) adversely affected effective transparency. Joint meaning-making did occur with respect to shared understanding of this lack of nominal transparency.

Issy-les-Moulineaux	Evaluative and constructive dialogue games were one third of the corpus, which is indicative of shared meaning-making and a move towards effective transparency. Generally, there was a high degree of interactivity in participants responding to others' messages.
Den Haag	Constructive dialogue games were proportionately low, and participants had difficulty in discussing what data representations meant.
Dublin	Evaluative and constructive dialogue game categories accounted for 54% of all messages, which corresponds to a high degree of joint meaning-making.

Overall, the extent of effective transparency, *qua* meaning-making, for open data representations, is not yet at a satisfactory level for most pilots. This appears to relate to lack of a shared focus or joint project. In one case (Groningen), low nominal transparency (data sets) was a hindrance to effective transparency. It appears that achieving effective transparency requires greater experience or maturity of online working groups.

5.3.5 EVALUATION QUESTION 4: ONLINE EPISTEMIC COMMUNITIES (COMMUNITY EVOLUTION).

"To what extent are the interactions on SPOD/TET moving towards veritable online epistemic communities, involving collaboration (rather than unanswered isolated messages), specialisation of interactive roles and growth in participation?"

In the second year of the project, once SPOD-TET tools became usable, online communities were only just initiated. Therefore, the question of their development over time was not yet relevant for most partners. The matter is therefore rather one of detecting *potentialities* for moving towards online epistemic communities.

With the open consultation mode adopted at Prato, many citizens intervened briefly and sporadically, to give their own views. There was little actual group discussion, so far, to be developed. Similarly, with the cases of Issy-les-Moulineaux, Groningen and Dublin, the corpora collected are largely experimental in nature (involving students), and do not really form the bases for durable communities, although these experiments were useful as a proof of the SPOD-TET discussion concept. The Den Haag study did witness the emergence of a relatively stable group, but it lacked regulation.

In sum, the question of emergence of online communities will be more relevant in year 3 of the project.

Lessons learned from these results are discussed in section 6.2, below.

6 CONCLUSIONS, LESSONS LEARNED AND IMPLICATIONS FOR FURTHER WORK

6.1 CONCLUDING REFLEXIONS

During the second year of the ROUTE-TO-PA project, within Workpackage 3 (Models and Methods) we have succeeded in developing, at this stage of the project, an integrated approach to analysing and evaluating participants' activity on SPOD/TET platforms, across the participating countries. The approach integrates the year 1 Societal Model, the Year 2 Community Model, a Technology Usability layer, and prefigures the year 3 individual representations model. Thus, new developments have been achieved with respect to all models, whilst there is a primary focus on Task 3.2, the Community

Interactions Model. A key factor in integration has been the ‘vertical’ definition of two key interdisciplinary concepts across models: **transparency** and **engagement**.

This work has required an interdisciplinary effort, in order to combine insights from management and organisational sciences (on forms of democracy and concepts of transparency in government) with insights from psychology and language sciences on the nature of human technology-mediated task-focussed interactions. The resulting method identifies characteristics of joint action mediated by SPOD/TET that enable evaluation of the extent to which project goals have been achieved, as they have been redefined in operational terms.

Task 3.2, “Interactive Activities in Open Data Use” has been at the centre of the year 2 work in Workpackage 3. The model that has been developed is based on combining two psychological/linguistic models: Joint Projects and Dialogue games. This approach enables us to go beyond structural analyses (who is ‘linked to’ whom, or who replies to whom) in order to understand what it is that participants are trying to achieve (Joint Projects) on SPOD/TET, on and around open data/visualisations, and in what way do they engage in dialogue in order to do so. In this way, many concepts that have been evoked in research on social networks — such as “forms of participation”, “leadership”, etc. — are seen in a new and original light. For example, the emergence of “**leaders**” in an online community is understood here in terms of the incidence of interactive roles within specific dialogue games (e.g. who helps whom? Who provides information to whom? Who co-creates what with whom?; etc.). The term “leader” refers in fact to a ‘meta-role’, a ‘role-across-roles’, or a participant who initiates and regulates joint action, in a variety of different ways.

We believe that such a fine-grained qualitative-quantitative analysis is crucial for evaluating achievement of the project objectives of *promoting transparency* in relations between citizen-stakeholder groups and Public Administrations, since, given that *effective transparency* implies that meaning, knowledge can be co-created from open data, we need to understand the extent to which this has been achieved. Thus, dialogue game analysis, transparency and forms of democracy are tightly integrated, notably in the work that we have carried out.

Such an integration has drawn on not only further advances in year 2 of the societal model, developed in year 1, but also on the definition of a usability evaluation method, whose basic aim is to assess the extent to which the SPOD/TET tools do in fact support effective transparency, as defined above.

The community method has been developed whilst looking ahead to growth in SPOD/TET online epistemic communities, throughout the third year of the project. Therefore, certain aspects (such as analysis of development of communities over time) are less relevant than others, during the present reporting period.

This deliverable has been prepared in close collaboration with deliverable 5.2, which reports complete analysis and evaluation results of online epistemic communities so far, on the basis of methods and models developed in workpackage 3, and reported in the present document.

Finally, we have already given pointers, in the work described here, to the model and methods to be elaborated in workpackage 3 during the third and final year of the project, that focus on changes in individual participants’ representations, as a result of using SPOD/TET. As already mentioned, one aspect of this focus on the individual is already addressed, in behavioural/actional terms, i.e. the analysis of the interactive roles that individuals play in communities. In year 3, using interview, focus group and questionnaire evaluation tools, complementing the behavioural analysis, we shall focus on individuals’ representations of the degree of effective transparency of their relations with public administrations as well as their degree of engagement in this process.

6.2 LESSONS LEARNED AND IMPLICATIONS FOR FURTHER WORK

On the basis of the summary of results presented in section 5.3, above, three main lessons have been learned, with respect to promoting effective transparency on/around open data visualisations, using the SPOD-TET tools:

Lesson 1: *shared task focus*. In order for participants to engage in shared meaning-making on and around open data visualisations, the negotiation of a clear shared task focus, a joint project, is crucial, otherwise little genuine interaction is likely to occur.

Implications: we need to better define and explain what kinds of usage scenarios are relevant to using SPOD-TET, adapted to needs of groups of potential users. This task will need to be devolved towards moderators (see below). For encouraging personal commitment in the definition of a joint project and on the production of solutions, the platform could be considered and presented as an “online hackathon”, wherein individuals will have to take part actively in specific projects, sharing skills and knowledge for ensuring the success of these projects.

Lesson 2: *Nominal and effective transparency*. Lack of relevant data sets, or assistance in finding them, for achieving specific joint tasks will of course hinder effective transparency.

Implications: we need to solve the circular problem whereby SPOD-TET interactions are needed, to provide suggestions for more data-sets, but in order for the discussions to effectively occur, the datasets must be already there. This can be addressed via increased moderator/facilitator activity (see below).

Lesson 3: *moderators*. In many cases, moderators are the participants who import data visualisations into SPOD, not citizen (or other) users.

Implications: moderators will need to engage in more “helping” dialogue games, to assist users in identifying when data sets are relevant, how visualisations can be made and imported into SPOD and more generally, with respect to the meaningful joint projects that could be engaged in using the tools.

To this we can add the fact that, of course, usability of the technology underpins all such considerations. This has been considerably improved, moving into year 3 of the project.

In conclusion, we have shown that it is possible for groups of SPOD-TET users to achieve their shared goals, by means of co-constructing the meaning for open-data visualisations, in several cases. Better framing of joint tasks in specific communities, relating to more clear roles for online moderators, can help this to occur in a broader range of cases. ■

7 BIBLIOGRAPHY

- Allwood, J., Nivre, J., Ahlsén, E., 1991. On the Semantics and Pragmatics of Linguistic Feedback, *Gothenburg Papers in Theoretical Linguistics No. 64*. University of Gothenburg, Department of Linguistics, Sweden.
- Andriessen, J., Baker, M. & van der Puil, C. (2011). Socio-cognitive tension in collaborative working relations. In S. Ludvigsen, A. Lund, I. Rasmussen & R. Saljo (Eds.), *Learning across sites: new tools, infrastructures and practices*, pp. 222-242. London: Routledge.
- Andriessen, J., Baker, M., van der Puil, C., 2011. Socio-cognitive tension in collaborative working relations. In: Ludvigsen, S., Lund, A., Rasmussen, I., Saljo, R. (Eds.), *Learning across sites: new tools, infrastructures and practices*. Routledge, London, pp. 222-242.
- Attard, J., Orlandi, F., Scerri, S., & Auer, S. (2015). A systematic review of open government initiatives. *Government Information Quarterly*, 32(4), DOI: 10.1016/j.giq.2015070006.
- Bakeman, R. & Gottman, J.M. (1997). *Observing Interaction: An introduction to sequential analysis*. Cambridge: Cambridge University Press.
- Baker, M., Andriessen, J & Järvelä, S. (2013). *Affective Learning Together: social and emotional dimensions of collaborative learning*. London: Routledge.

- Baker, M., Détienne, F., Lund, K., Séjourné, A., 2003. Articulation entre élaboration de solutions et argumentation polyphonique. In Bastien, C. (Ed.), *Actes des Deuxièmes Journées d'Etude en Psychologie ergonomique – EPIQUE*. INRIA, Rocquencourt, pp 235-240.
- Baker, M., Détienne, F., Lund, K., Séjourné, A., 2009. Etude des profils interactifs dans la conception collective en architecture. In : Détienne, F., Traverso, V. (Eds.), *Méthodologies d'analyse de situations coopératives de conception: le corpus MOSAIC*. PUN, Nancy, pp 183-220.
- Baker, M.J., 2002. Forms of cooperation in dyadic problem-solving. *Revue d'Intelligence Artificielle*, 16 (4-5), 587-620.
- Bales, R. F., 1950. *Interaction process analysis: A method for the study of a small group*, The University of Chicago Press, Chicago, IL.
- Barcellini, F., Détienne, F., Burkhardt, J.M., 2008a. User and developer mediation in an Open Source Software Community: boundary spanning through cross participation in online discussions. *International Journal of Human Computer Studies*, 66 (7), 558-570.
- Barcellini, F., Détienne, F., Burkhardt, J.M., 2014. A situated approach of roles and participation in Open Source community. *Human-Computer Interaction*, 29(3), 205-255.
- Barth, E.M., Krabbe, E.C.W., 1982. *From Axiom to Dialogue: A philosophical study of logics and argumentation*, Walter de Gruyter, Berlin.
- Benne K. & Sheats, P., (1948). Functional roles of group members. *Journal of Social Issues*, 55, 41-49.
- Birkinshaw, P. (2006). Transparency as a human right. In C. Hood, & D. Heald, *Transparency: The Key to Better Governance?* (pp. 47-58). Oxford: Oxford University Press.
- Blanchard, A., & Markus, M. L. (2004). The experienced sense of virtual community: Characteristics and processes. *The Data Base for Advances in Information Systems*, 35(1), 65–79. <http://dx.doi.org/10.1145/968464.968470>.
- Bunt, H. C., 1989. Information dialogues as communicative action in relation to partner modelling and information processing. In: Taylor, M.M., Néel, F., Bouwhuis, D.G. (Eds.), *The structure of multimodal dialogue*. Elsevier Sciences Publishers, North-Holland, pp. 47-74.
- Bunt, H. C., 1995. Dialogue Control Functions and Interaction Design. In: Beun, R.J., Baker, M.J., Reiner, M. (Eds.), *Dialogue and Instruction, Modeling Interaction in Intelligent Tutoring Systems*. Springer, Berlin, Germany, pp 197-214.
- Clark, H.H. (1996) *Using Language*. Cambridge: Cambridge University Press.
- Clark, H.H. (1999). On the origins of conversation. *Verbum*, Tome XXI, n°2, pp. 147-161.
- Détienne, F., Baker, M., Burkhardt, J-M., 2012c. Quality of collaboration in design meetings: methodological reflexions. Special issue : Perspectives on quality of collaboration in design. *CoDesign: International Journal of CoCreation in Design and the Arts*. 8(4), 247-261.
- Détienne, F., Baker, M., Fréard, D., Barcellini, F., Denis, A. & Quignard, M. (2016). The Descent of Pluto: interactive dynamics, specialisation and reciprocity of roles in a Wikipedia debate. *International Journal of Human-Computer Studies*, 86, 11-31.
- Détienne, F., Barcellini, F., Baker, M., Burkhardt, J-M., Fréard, D., 2012a Online epistemic communities: theoretical and methodological directions for understanding knowledge co-elaboration in new digital spaces. *Work: A Journal of Prevention, Assessment and Rehabilitation*, 41(1), 3511-3518.
- Dreier, O. (1999). Personal trajectories of participation across contexts of social practice. *Outlines: Critical Social Studies* 1:5-32.
- Fréard, D., Denis, A., Détienne, F., Baker, M., Quignard, M., Barcellini, F., 2010. The role of argumentation in online epistemic communities: the anatomy of a conflict in Wikipedia. In *Proceedings of the 28th Annual European Conference on Cognitive Ergonomics (ECCE '10)*. ACM, New York, NY, USA, pp 91-98.
- Fréard, D., Détienne, F., Baker, M., Quignard, M., Barcellini, F. & Denis, A. (2012) Visualising zones of collaboration in online collective activity: a case study in Wikipedia. *ECCE 2012, European Conference of Cognitive Ergonomics*, Edinburgh, UK, August 28-31. <http://hal.inria.fr/hal-00766463/>
- Giddens, A. 1984. "The Constitution of Society Elements of the Theory of Structuration," in *The Constitution of Society - Outline of the Theory of Structuration*, University of California Press, Berkeley and Los Angeles.
- Gleave, E., Welser, H.T., Lento, T.M., Smith, M.A., 2009. A Conceptual and Operational Definition of 'Social Role' in Online Community. In *Proceedings of the 42nd Hawaii International Conference on System Sciences*, IEEE, pp. 1-11.
- Grosz, B.J., Sidner, C., 1986. Attention, Intentions and the Structure of Discourse. *Computational Linguistics*, 12(3), 175-204.
- Hamblin, C.L. (1971). Mathematical models of dialogue. *Theoria*, 37, 130-155
- Harrison, T., & Sayogo, D. (2014). Transparency, participation and accountability practices in open government: a comparative study. *Government Information Quarterly*, 31, 513-525.
- Heald, D. (2006). Varieties of Transparency. In C. Hood, & D. Heald, *Transparency the Key to Better Governance*. Oxford: University Press.
- Jahnke, I., 2010. Dynamics of social roles in a knowledge management community. *Computers in Human Behavior*, 26 (4), 533-546.
- Lave, J. & Wenger, É. (1991). *Situated Learning: Legitimate Peripheral Participation*. Cambridge: Cambridge University Press.
- Levin, J.A. & Moore, J.A. (1983). Dialogue-Games: Metacommunication Structures for Natural Language Interaction. *Cognitive Science*, 1(4), 395-420.
- Liberati, A., Altman, D., Tetzlaff, J., Mulrow, C., Gøtzsche, P., P.A., I. J., et al. (2009). The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate health care interventions: Explanation and elaboration. *Annals of Internal Medicine*, 151(4), W65–W94.
- Linton, R., 1936. *The study of man*, Appleton–Century–Crofts, New York.

- Malinen, S. (2015). Understanding user participation in online communities: A systematic literature review of empirical studies. *Computers in Human Behavior* 46, 228–238
- Mann, W.C. (1988). Dialogue Games: Conventions of Human Interaction. *Argumentation* 2, 511-532.
- Meijer, A., Curtin, D., & Hillebrandt, M. (2012). Open Government: connecting vision and voice. *International Review of Administrative Sciences*, 78 (1), 10-29.
- Millard, J. (2015). Open governance systems: Doing more with more. *Government Information Quarterly* .
- Nam, T. (2011). Suggesting frameworks of citizen-sourcing via Government 2.0. *Government Information Quarterly*, 29, 12-20.
- Ojo, A., Janowski, T., and Awotwi, J. 2013. "Enabling development through governance and mobile technology," *Government Information Quarterly* (30:SUPPL. 1), Elsevier Inc., pp. S32–S45 (doi: 10.1016/j.giq.2012.10.004).
- Petticrew, M., & Roberts, H. (2006). *Systematic Review in the Social Sciences. A Practical Guide*. Malden, MA: Blackwell Publishing.
- Power, R. (1979). The organisation of purposeful dialogues. *Linguistics*, 17, 107-152.
- Preece, J., 2000. *Online communities: designing usability and supporting sociability*. New York, USA : John Wiley and sons.
- Rheingold, H. (1993). *The virtual community. Homesteading on the electronic frontier*. London: MIT Press
- Ritz, A., Brewer, G., & Neumann, O. (2016). Public Service Motivation: A Systematic Literature Review and Outlook. *Public Administration Review*, 76 (3), 414-426.
- Sack, W., Détienne, F., Ducheneaut, N., Burkhardt, J-M., Mahendran, D., Barcellini, F., 2006. A methodological framework for socio-cognitive analyses of collaborative design of Open Source Software. *CSCW*, 15 (2-3), 229-250.
- Schraagen, J. M., Chipman, S. F., & Shute, V. J. (2000) State-of-the-art review of cognitive task analysis techniques. In J. M Schraagen, S. F. Chipman & V. J. Shute (Eds.), *Cognitive Task Analysis* (pp. 467-487). Mahwah, NJ: Lawrence Erlbaum Associates.
- Scott, J. (2013). *Social Network Analysis*. 3rd Edition. Sage: London.
- Seffah, A., Donyaee, M., Kline, R. B., and Padda, H. K. 2006. "Usability measurement and metrics: A consolidated model," *Software Quality Journal* (14:2), pp. 159–178 (doi: 10.1007/s11219-006-7600-8).
- Smets, K., Goethals, B., Verdonk, B. 2008. Automatic vandalism detection in Wikipedia: Towards a machine learning approach. *AAAI Workshop on Wikipedia and Artificial Intelligence: An Evolving Synergy*, pp. 43-48.
- Suh, B., Convertino, G., Chi, E.H., Pirolli, P., 2009. The Singularity is Not Near: Slowing Growth of Wikipedia. In *Proceedings of the 5th International Symposium on Wikis and Open Collaboration*, ACM.
- Tummers, L. B. (2015). Coping During Public Service Delivery: A Conceptualization and Systematic Review of the Literature. *Journal of Public Administration Research*, 25 , 1099-1125.
- Venkatesh, V., Morris, M. G., Davis, G. B., and Davis, F. D. 2003. "User acceptance of information technology: Toward a unified view," *MIS Quarterly* (27:3), pp. 425–478 (doi: 10.2307/30036540).
- Watzlawick, P., Beavin, J., Jackson, D., 1967. *Pragmatics of human communication*, Norton, New York.
- Welser, H.T., Cosley, D., Kossinets, G., Lin, A., Dokshin, F., Gay, G., Smith, M., 2011. Finding social roles in Wikipedia. In *ACM proceedings of iConference 2011*, Seattle, WA, USA: ACM, pp. 122-129.
- Welser, H.T., Gleave, E., Fischer, D., Smith, M., 2007. Visualizing the Signatures of Social Roles in Online Discussion Groups. *The Journal of Social Structures*, 8 (2).
- Wilkinson, D. M., Huberman, B. A., 2007. Cooperation and quality in wikipedia. In *WikiSym '07 proceedings of the 2007 international symposium on Wikis*, New York, NY, USA, pp 157–164.
- Wittgenstein, L. (1978). *Philosophical Investigations*. Oxford: Basil Blackwell.
- Worthy, B. (2015). The impact of open data in the UK: complex, unpredictable, and political. *Public Administration*, 93 (3), 788-805.

8 APPENDICES

8.1 APPENDIX 1: DIALOGUE GAME ANALYSIS TABLES

This Appendix reproduces the Tables to be filled in for quantitative analysis of each online discussion segment, on the basis of qualitative analysis (coding of joint projects and dialogue games).

General table for corpus analysis

Dialogue transcript (with visualisations)			Joint Projects		Dialogue games			Content		Space/tool
Participant	Time of message	message	JP name	JP phases	Category	DG-name	Roles	Link with open data (viz.): 1. linked to an information source (OD, website, etc.) or not? (Y/N) 2. If Y, specify the type of information source (OD, weblink, wiki, article, ...)	Free list of topics, chosen by analyst, depending on nature of context, joint project	e.g. agora, co-creation room, ...

Characteristics of Joint Project Phases and Dialogue Games

Phases		regulative	informative	evaluative	constructive	Total
PROBLEM-FRAMING	Dialogue games	Number of regulative Dialogue Game e.g. 2 [CR; SC]				
	Open Data	Number of OD per DG e.g. [3; 0]				
	Number of messages per DG	Number of messages per DG e.g. [8; 1]				

	Number of participants per DG	Number of participants per DG e.g. [10; 9]				
IDENTIFICATION	Dialogue games	Number of regulative Dialogue Game e.g. 2 [CR; SC]				
	Open Data	Number of OD per DG e.g. [3; 0]				
	Number of messages per DG	Number of messages per DG e.g. [8; 1]				
	Number of participants per DG	Number of participants per DG e.g. [10; 9]				
INTERPRETATION	Dialogue games	Number of regulative Dialogue Game e.g. 2 [CR; SC]				
	Open Data	Number of OD per DG e.g. [3; 0]				
	Number of messages per DG	Number of messages per DG e.g. [8; 1]				
	Number of participants per DG	Number of participants per DG e.g. [10; 9]				
PRODUCTION	Dialogue games	Number of regulative Dialogue Game e.g. 2 [CR; SC]				
	Open Data	Number of OD per DG e.g. [3; 0]				
	Number of messages per DG	Number of messages per DG e.g. [8; 1]				

	Number of participants per DG	Number of participants per DG e.g. [10; 9]				
(OTHER)	Dialogue games	Number of regulative Dialogue Game e.g. 2 [CR; SC]				
	Open Data	Number of OD per DG e.g. [3; 0]				
	Number of messages per DG	Number of messages per DG e.g. [8; 1]				
	Number of participants per DG	Number of participants per DG e.g. [10; 9]				

Characteristics of Joint Project by participants

JP Name	Participant	List DG of each JP in their order	Role / 'name of the DG'	Number of messages / 'name of the DG'	Number of visualisations / 'name of the DG'	Average Number of messages	Average Number of visualisations	Profile (more frequent roles)
e.g. Groningen Earthquake	e.g. Johnny	e.g. Deliberation, Argumentation	Initiator - D	3 - D	5 -D	89	100	
	e.g. Fred	e.g. Deliberation, Argumentation						

8.2 APPENDIX 2: USABILITY QUESTIONNAIRE

Usability Evaluation		Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
		1	2	3	4	5
1	The list of datasets retrieved using a “keyword” search are relevant					
Additional Comments:						
2	The search results, data tables and charts are: (a) Clear and easy to read					
Additional Comments:						
	The search results, data tables and charts are: (b) Simple and Understandable					
Additional Comments:						
3	The tools to create and store data artefacts are simple to use					
Additional Comments:						
4	The buttons and controls on the platform are self descriptive and intuitive					
Additional Comments:						
5	The number of steps to create a data visualisation are few enough					
Additional Comments:						
6	Using the tools to achieve my goals is simple					
Additional Comments:						

Technology Evaluation - M						
1.	The tool helps me to find the data that local government has published <i>relevant</i> to my concern					
Additional Comments:						
2.	The tool helps me to <i>understand</i> the data that local government has published					
Additional Comments:						
3.	The tool enables me to <i>contact</i> the institution that publishes the data					
Additional Comments:						
4.	Using the data visualisation tools, I can quickly see if the dataset is of good quality					

	Additional Comments:				
5.	There is open data available that is relevant to my concern				
	Additional Comments:				
Technology Evaluation – D					
<i>As a local authority employee, SPOD and TET could be used as an internal collaboration tool across sections, departments and other local authorities to discuss data, ideas and create solutions. With this in mind, please answer the following:</i>					
1.	The tools provide a platform where I can create and join a deliberation group				
	Additional Comments:				
2.	The tool enables me to collaborate with others to deliberate on an issue				
	Additional Comments:				
3.	Data visualisations created using the tools facilitate the deliberation process				
	Additional Comments:				
4.	The tools facilitate our group to <i>arrive at some conclusions</i> after deliberation				
	Additional Comments:				
Technology Evaluation - P					
1.	The tool enables me to create data or information on the platform				
	Additional Comments:				
2.	The tool helps me to <i>join</i> a co-creation project				
	Additional Comments:				
3.	The tool helps me to <i>coordinate and collaborate</i> with others to achieve our co-creation goals				
	Additional Comments:				
4.	The tool allows me to <i>view</i> the information contributed by others regarding our co-creation project				
	Additional Comments:				

User Level Evaluation - M		Strongly Disagree	Disagree	Neither	Agree	Strongly Agree
		1	2	3	4	5
1.	I am more aware than before about local government data and activity relevant to my concern					
	Additional Comments:					

2.	I am able to <i>access</i> data/information published by local government relevant to my concern.					
Additional Comments:						
3.	I can <i>understand</i> government data and activities relevant to my concern.					
Additional Comments:						
4.	Now that I can <i>find</i> and <i>understand</i> datasets relevant to my concern my <i>trust</i> in government claims and decisions has increased.					
Additional Comments:						
User Level Evaluation – D						
As a local authority employee, SPOD and TET could be used as an internal collaboration tool across sections, departments and other local authorities to discuss data, ideas and create solutions. With this in mind, please answer the following:						
1.	Access to open data through the tool makes me more <i>involved</i> in group affairs <i>relevant</i> to my concern					
Additional Comments:						
2.	Deliberating over open data using the tools enables me to learn more about other sections/departments/local authorities					
Additional Comments:						
3.	Deliberating over open data using the tool enhances my sense of <i>trust</i> in local government					
Additional Comments:						
4.	Being involved in deliberation over open data offers me better sense of <i>connection</i> with other members of staff					
Additional Comments:						
5.	I feel <i>empowered</i> to be involved with others in <i>deliberation over open data</i> relevant to our concerns					
Additional Comments:						
User Level Evaluation - P						
1.	Working with open data using the tool <i>enables</i> me to cooperate with others in different groups to achieve <i>common goals</i>					
Additional Comments:						
2.	Working with open data using the tool <i>empowers</i> me to co-create solutions to group problems					
Additional Comments:						

3.	Working with open data using the tool offers me an opportunity to <i>learn</i> more about <i>co-creating</i> solutions to meet group goals					
	Additional Comments:					
4.	The tool facilitates better <i>relationship and networking</i> among my group members in achieving group goals					
	Additional Comments:					
<p><i>Any other comments not addressed by the questions asked above: (All feedback is welcome to help us to improve the tools and the user experience)</i></p>						

8.3 APPENDIX 3: DRAFT CRITERIA FORMULATED BY PILOTS AUG/SEPT 2016

Pilot	Den Haag	Prato	Dublin	Issy	Groningen
LEVEL					
Technology	User friendly platform				
	Enhancing co-creation			Enhance co-creation of new services	Useful comments regarding further development of the tool
User	Releasing available and relevant datasets (for scenario and participants)	Number of created datasets	Number of new datasets created	Releasing relevant datasets (for scenario)	Finding the right match between information needed by users and the available information
	Releasing other relevant sources relevant for scenario also on TET and SPOD e.g. news regarding policy and project initiatives (council information)	Number of produced datasets by PA		Releasing (new) data from other establishments (public and private)	
			Number of data publishers (pa's) skilled in using tool (short)		
	SPOD and TET are easy to use for consultation and reflection	User satisfaction: <ul style="list-style-type: none"> - Interface - Access to data - Building of datalets - Creation of datasets - Knowledge on Open Data - Interest in re-using the platform 		Users experience platform as useful in facilitating discussion	Number of people participating in the testing of the tools and why did they get involved and what was their experience

Community	Enhance feedback and communication: Consultation, asking for input and advice			Enhance interaction and communication between suppliers (e.g. pa's) and between suppliers and businesses	Degree of collaborative learning within the community of citizens and pa's
	Active Community of PA's, citizens, businesses	Number of users Number of posts Number of created datalets Number of likes/dislikes	Number of users Number of conversation threads Number of thematic conversations	Number of participants, Number of discussions, Number of shared datalets, Participation frequency	Number of participants
	Generating ideas	Structure of the discussion Number of produced proposals	Number of ideas generated (long term) Number of co-creation rooms (mid term)		Number of ideas and quality (in terms of high value) of ideas generated during the collaborative learning process regarding the policy issue and the administration
		User Satisfaction: Effectiveness of discussion Creation of shared documents Level of acceptance of produced proposals by the PA			
Society	Participatory	Monitorial/Deliberative	Deliberative	Participatory	Deliberative
<i>Organizational</i>					Degree to which the open data ambitions of the administration are

<i>Impact</i>					clear and reflected in project proposals and department plans
<i>(Societal impact)</i>	Policy design and implementation together with businesses, citizens and partners	Create discussion and generate proposals	Facilitate discussion around city challenges	Co-create innovative applications/services	Degree to which stakeholders have been involved in the design of policy decline issues/scenarios
	Enhance transparency of government policy and implementation		Co-creation of ideas that identify city challenges	New economic opportunities for businesses	

8.4 APPENDIX 4: GUIDELINES FOR ANALYZING ONLINE INTERACTIONS ON THE SPOD

1. Introduction :

Reminder :

The WP3 aims to provide the theoretical and methodological foundations for understanding users' needs and goals in using the transparency enhancing tools, as well as for defining methods, for evaluating and understanding the project outcomes.

Within this framework, the task 3.2, assigned to CNRS is to elaborate « a model that enables 'mapping' of forms of participation within the network of relations in the online community, including analysis of emergent roles and clusters of more intense communications that constitute close collaboration »

Goal:

So, the goal of this document is to present the methodology for analyzing : online discussion on the SPOD and the evolution of these interactions. It includes, among others, the study of community building process (e.g. the numbers of participants, their messages, their evolutions) and more precisely the way that communities grow, develop over time.

We propose here, a method for analyzing the collaborative activity around Open Data. It could be done through a study of the interactive dynamics of online discussions on the SPOD. But It supposes to understand how the different interactions lead to the development of common representations, of a common context.

So, it leads to distinguish the goal of each interaction and, in this way, to distinguish the different common projects (at a meta level). But it also involves (at a meso level) identifying the different sequences of events for each project. And at a more detail level, it commits to examine the object of each activity within these events & finally, in the light of these events, to define participants interactive roles.

To achieve these three goals, we will base on two principle models: Joint Activity theory and Dialogue Game theory.

2. Theory/Literature :

Joint activity theory considers that each action and dialogue is processed in terms of a concatenation of hierarchical projects and subprojects (Clark, 1996). We talk about Joint projects.

Joint projects are a set of actions (in different spaces, discussion or visualisation) of participants which are all related to a main and shared goal of activity (or emerging task). This notion of Joint Project will allow us to reconstruct coherency of (dispersed in the SPOD/TET) actions with respect to a main task (problem solving).

The theory of dialogue games originated in Wittgenstein's (1978) notion of a "language game".

The term "dialogue", here, must be understood as multimodal joint action, where communication can be expressed in words (in typed messages) or using other actions on the interface.

According to the theory, Dialogues games could be considered as « bilateral structures containing conventional actions of both players for specific interactions - kind of « shared scripts » » (Maudet & Evrard)

3. Analysis Method

On the SPOD, participants connect together with the aim of collectively exploiting open data. We suppose that groups of SPOD members who share a common goal will emerge and interact.

In this context, we consider each - interaction (on the SPOD) focused on a common goal - as a Joint project. In this Joint project, each sequence of events could be viewed as a dialogue game.

And so, the topic of each DG (and thus the commitment of each participant) could be analyzed in terms of production and discussion.

So, in the present tutorial, we will begin by considering the method of identification of the joint projects, then we will focus on the segmentation process of Dialogue Games and finally we will present a procedure for extracting and analyzing quantitative data.

We study a corpus composed by a large and structured set of texts, graphic visualisations and other actions related to the production of texts and visualisations on the co-creation room and on the agora.

The first step of this analysis is to identify, within these corpus, the different joint projects.

3.1. Joint project approach:

Joint Projects have generally two parts.

Firstly, a « speaker » who proposes a joint project. For example, in our experiment, a participant called « Julien » who proposes to define more precisely the problematic of the experiment before researching data and before beginning the construction of visualisations”.

Secondly, the « addressees » who take it up. For example Alexandra who said “I created a map for the colleges and lycées in Ile de France”

These components (the speaker and the addressees) take part of a common plan whose boundaries (that is to say, the beginning and the end of the joint project) are characterized by verbal and non verbal indicators.

- Opening / closing: “(e.g. hello every body. I suggest that we begin by studying data related to school, transport..”; “OK. That’s fine for me.”)
- Moderator intervention (e.g. I think, it would be preferable to focus topic on...)
- Time Gaps
- Topic coherence shift

This a non-exhaustive list of indicators. You can add another.

In this framework, each joint project could involve 2 or more participants (e.g. SPOD members).

These participants try to establish and achieve joint public goals. These goals are known and explicitly announced to the others (e.g. obtain data in order to develop a digital application; obtain data in order to understand the economical consequences of pop. decline).

And they individually try to achieve private goals (e.g. PAs would like to preserve economical and political interests).

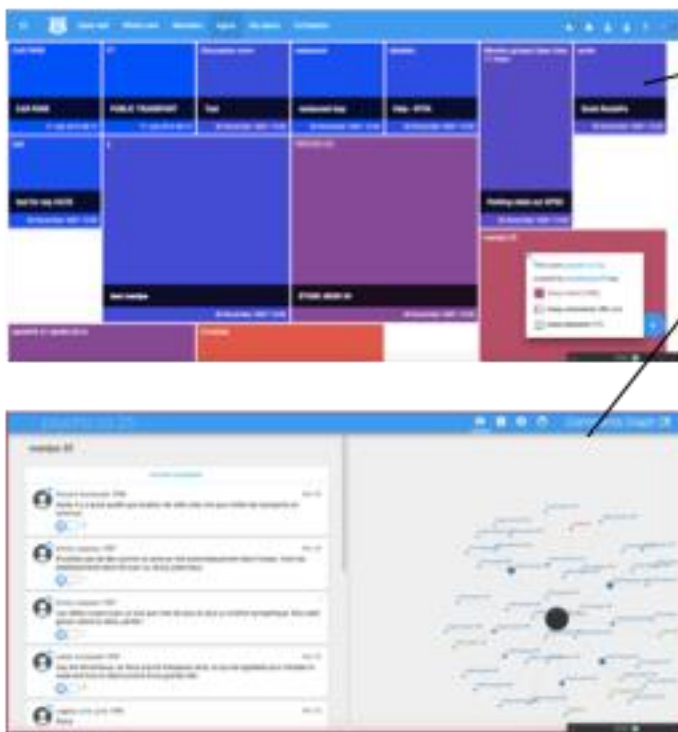
Example on the SPOD:

Joint projects correspond to discussions, (ii) visualisations and (iii) other actions carried out regarding a specific objectives linked to a general topic.

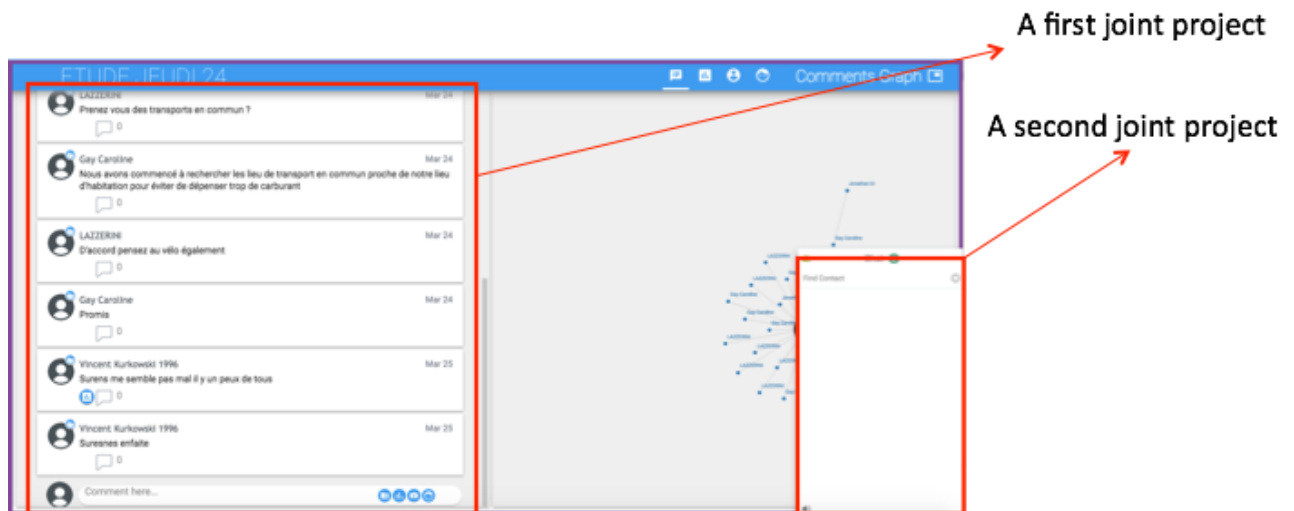
For example, a general topic related to the accessibility of public transports in Paris Region and a specific goal collectively determined by participants, which could be « to find bus station accessible for people with disabilities in Paris Region ».

accessibility of public transports

Bus stations for people with disabilities



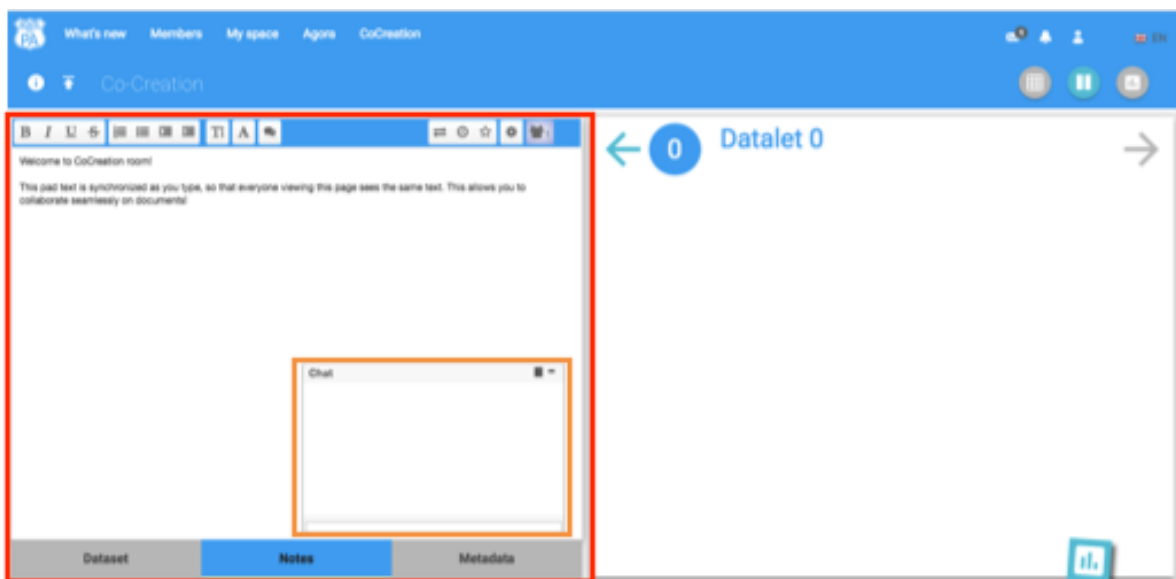
On the Agora, everything that takes place in a room could take part of the same Joint Project (included parallel discussions on chatroom)
If there is a change of topics, an interruption, an important time gap: a new joint project is engaged.



Concerning the co-creation room: everything that takes place in the notes box, the public chatroom, the private chatroom and obviously everything that takes place in the discussion space could take part of the same Joint Project.

But if there is a change of topics on the box, or between the box and the public chatroom, or between the box and the private chatroom, a new joint project is created.

In the following example, you could find two different joint projects: the first one in the « notes » box and the second one in the chartroom.



So, after identifying the joint projects, a second step should be engaged. This step concerns the analysis of the different episodes that compose each joint project. We call them Dialogue Games.

3.2. Dialogue Game approach:

3.2.1 Segmentation phase

Study Dialogue Game involves to segment each Joint Project in a series of episodes.

This segmentation process is determined by :

- the role of each participant. (e.g. it concerns the participants who starts the discussion; the participants who seeks help)
- the description of the interaction = the common task engaged by the participants

- the topic of the interaction. On a same Dialogue game, it could be found different topics (e.g. A discussion on mobility could concern different topics: Accessibility or Timetable or Development of new lines)
- the gloss of this interaction

Currently, we distinguish 7 principle categories of Dialogue Games, that you could complete.

DG Names	Description	Gloss	Roles
Regulation	Someone specifies goal and organises discussion	Task orientation - Define a joint objective (try to answer to specific issue by proposing a common definition of this issue) + Facilitate interaction	Regulator, discussant, follower
Helping	Someone helps someone else to do something	participant who requests help is able to perform a specific action	Helper and helped
Information-seeking	Someone provides information to someone else	participant who requests information acquires it	Information-seeker, Information-provider
Deliberation	People discuss in order to make a decision	Participants choose together the most effective decision to adopt	Co-deliberator, Co-deliberator
Argumentation	Conflict between participants (the interpretation of some data, the value of some data, ...). Opposite point of views	Choose one view (Deciding who is right)	Proponent, Opponent
co-creation	Collaborative problem-solving	Agree on a solution to the shared problem	Co-creator, Co-creators
Gripping	Someone gives critical remarks	Focus attention on specific issues (e.g. technical)	Griper, solution-maker

In case of doubt concerning the segmentation process (the identification of Dialogue games), we advice you to use specific indicators, related to each Dialogue Game.

The regulation process is characterized by regular re-launches, by invitation to accomplish some specific tasks.


Line N°	Participant	Messages and visualisations		DG Analysis
		Thread level 0	Thread level -1	
1	Julien :	Hello [in English in the original]		REGULATION
2	Julien :	I propose that we analyse the problem before beginning?		
3	Julien :	Ok for you?		
3.1	Alexandra Simon :		Good for me	
4	Julien :	We have to find a town, with a college, a lycée, school and transports		
5	Julien :	Let's start with the college and lycées		
6	Julien :			
7	Clémentine :	Hello		
7.1	Julien :		hello, I leave you to read the comments :)	
7.2	Julien :		I copied the other discussions :)	
7.3	Clémentine :		I've just read, we're looking for a town that has a college and a lycée and transports	
7.4	Jonathan (J.) :		yes	

Line N°	Participant	Role	Date	Messages and visualisations		DIALOGUE GAME	
				Thread level 0	Thread level -1	Role	Game
1	Boris J.	Student	April 25	Meeting 1 (Susan, Naomi, Wouter and Boris). During the meeting we discussed the context (problem, purpose and data themes)		INSTRUCTOR	INSTRUCTING
				<p>Problem:</p> <p>There is population decline in Northeast Groningen. This means not only that there are less citizens living in the area but the decline is also affecting health care, liability, employment and the economy</p> <p>Purpose:</p> <p>Data themes</p> <p>To connect the local economy around the five themes. First of all we need data concerning the economy (sectors, import-export, agriculture, service and factories). Second we want data about citizens (livability, diversity, unemployment). We'll also look for energy supply and the surroundings, the role of the province in the local economy and already existing ideas</p> <p>Planning</p> <p>We are now individually looking for datasets. We will work in the co-creator and agora (later on).</p>			

The information seeking process or open data analysis process is generally associated with data visualisation or study of data.

4	Naomi	Student	April 28	@ Province Groningen: could you please tell me more about the Agriculture agenda? A big part seems to rely on the own initiative of the organizations, is that correct? What role does the Province have in this? In addition I wondered which criteria there are for companies in order to get subsidies. Is it possible to indicate how much subsidies are involved?	INFORMATION SEEKER	INFORMATION SEEKING
5	Naomi	Student	April 28	@lochem: How can I upload other sites than CBS? Such as those of hotels and campgrounds of the <i>Westerkwartier</i> ?	INFORMATION SEEKER	INFORMATION SEEKING
6	Jochem	Moderator or/another	May 3	With other websites you have to look what datasets they have. You can also generate your own dataset in <i>Excel</i> and send it to me.	INFORMATION PROVIDER	
7	Berend	Student	May 2	@ Jochem this site https://databble.nl/bedrijfsgegevens/lochem/ has many relevant datasets if it concerns which companies are working with food production/processing.	INFORMATION PROVIDER	
8	Alexandra Simao			I created a map for the colleges and lycées in Ile de France.	INFORMATION-SHARING (open data analysis)	
9						
9.1	Jonathan Gr.			What can we infer from it?		
9.2	Julien			nothing. We should have two maps.		
9.3	Alexandra Simao			I'll take care of remaking a new map with uniquely the colleges and the lycées so that it will be more clear.		
9.4	Alexandra Simao			Therefore, two maps.		
9.5	Alexandra Simao			Here is the map of colleges in IDF.		
9.6						

The deliberation process corresponds to a phase during which participants propose a solution to the

9.10	Julien		saint mande or vincennes, we should study the transportation.	DELIBERATION	
9.11	Alexandra Simao		Me, it wanted to propose Neuilly sur Seine.		
9.12	Alexandra Simao		Because the price per m² is affordable in comparison with other places.		
9.13	Alexandra Simao		There you are.		
9.14					
12.2	Alexandra Simao		So which town do we choose?		
12.3	Julien		issy les moulineaux?		
12.4	Alexandra Simao		issy les Moulineaux.		
12.5	Clémentine		I rather agree.		
12.6	Alexandra Simao		Because of the level of free access cars, there are quite a few of them, there are colleges and lycées and the price per m² is more affordable in comparison with Boulogne.		
12.7	Julien		Not far from Paris is.		
12.8	Alexandra Simao		Alright then, we stick with isy les Moulineaux.		
12.9	Alexandra Simao		In that case what do we look at now?		
12.10	Clémentine		Indeed, the town of Issy les Moulineaux is well equipped on all these points.		
12.11	Clémentine		The proximity to Paris is a good point, and also the transports, well served.		

initial issue by basing on visualisations.

The helping process is characterized by the providing of additional information and/or by some regular requests.

8	Eric	Stakeholder	May 2	Hello everyone. It is a bit of a puzzle but I think this is the area where I can provide feedback. I'm involved in the community cooperation Westerkwartier. If you have questions I might be able to help you!	HELPER	HELPING
9	Wouter	Student	May 5	Hello Eric, Great that you are active now as well! I come across a lot on the internet regarding the bio-based economy in Drenthe and I wondered if Groningen collaborates with the Province of Drenthe in terms of idea sharing around the bio based economy? And I wondered there are any specific databases (about agriculture) of the Westerkwartier that are lacking but valuable to you so that we can look specifically for those datasets in our research. Thanks so much!	HELP REQUESTER	

And finally, argumentation corresponds to a conflict that suspends the discussion and so by the emergence of an opponent, a debate.

Gripping is defined by the apparition of remarks focused on the system and not specifically on the content.

3.2.2 coding phase

The second phase of this analysis involves a coding process. So data collected have to be categorized in a table where the discussion thread, the order of interaction has to be respected.

These data must be classified according to:

- the type of DG
- the nature of interaction (visualisation/discussion) - in case of visualisation, please copy-cut and describe the visualisation
- the topic
- the space where they take place (e.g. discussion space, chatroom)
- the moment when they take place
- the role of participant
- the joint project to which it belongs - if two simultaneous Joint Projects appear, the parallel joint project has to be reported in a second cell. That is the reason why it is necessary to precise the space where discussions took place

Example:

An interaction on the co-creation room : on the chat rooms - on the notes box - on the discussion space									
Participant	time	discussion	visualisation	Dialogue Game	role of the participant	content	space	Joint Project	In parallel of JP
Nicolas	13:37	Hello. I propose to begin by an analysis of data from Paris Region Open data website		Regulation	Starter - Regulator	Accessible bus station in Paris Regions	public chatroom	find data concerning accessibility in transport in Paris Region	
Jacques	13:40	Ok little man		Regulation	Co-regulator		public chatroom	find data concerning accessibility in transport in Paris Region	
Valery	13:50	François. I prefer to study the techniques used to make accessible classical stations in France.		Argumentation	Opponent, proponent		Private chatroom	find data concerning accessibility in transport in Paris Region	find how facilitates the transformation of classical stations in accessible stations
François	13:55	completely agree. Nicolas' axe is not relevant		Argumentation	Opponent, proponent		Private chatroom	find data concerning accessibility in transport in Paris Region	find how facilitates the transformation of classical stations in accessible stations
Nicolas	13:50	Great		Regulation	regulator		public chatroom	find data concerning accessibility in transport in Paris Region	
Nicolas	13:55		This is data from Paris Region transports	information sharing	Information provider		discussion space	find data concerning accessibility in transport in Paris Region	

Remark: Think to reserve a section devoted to the activity of each participant, his public goal and his private goal. This will be necessary for analyzing more precisely - the potential reasons of the creation of a new joint project - or - the opening of new discussion space

Activity	Public Goal	Private Goal

3.2.3 quantitative data

Beyond the qualitative data, it is necessary to analyse quantitative information in order to determine the processing underlying by the observation related to Dialogue game analysis.

Firstly, information concerning the participation rate has to be collected in order to distinguish regular contributors and occasional users (or active and passive actors).

Secondly, - the average number of messages / participant / DG - is useful to study data related to the commitment of each participant ; it allows specifying their general roles.

Furthermore, the distribution of DG , and their impact on the final outcome could be measured by the number of messages per DG

And finally the average number of visualisations per participant and per DG is necessary to study the effect of graphic visualization on the decision making - at individual and community levels -.

As did previously, quantitative data would be gathered in a summary table.

