

Exploring the UK Open-PSI Community

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1. ABSTRACT

This paper examines the process of adoption of 'Linked Open Data' within the UK Open Public Sector Community. We use a social science approach – Actor Network Theory (ANT) – as an analytical framework which enables us to explore the formation and stabilisation of networks of actors. The analysis details the actors involved within the PSI community, examining their interrelations and interactions. We conclude with some remarks regarding the barriers and enablers within the network, and discuss the potential analysis of other Open Government data initiatives based on our approach.

2. INTRODUCTION

In the last two years, there has been a substantial increase in the number of Open Government initiatives [1]. Countries such as United Kingdom, Australia and Denmark has followed in the footsteps of the United States, placing data transparency and open data as high priority. The aim of these initiatives is to provide people with access to public sector data in a standardised and linked format, with the belief that making previously unpublished and obscure data available will enable an informed understanding of government decisions [2]. However, these initiatives do not come without their problems, and have had varying success due to a number of barriers and stumbling blocks during their development [1].

Open Government initiatives are complex, not only stimulating change for the government and wider society, but also for technologies such as the Web. The communities that form around Open Government initiatives involve a high level of socio-technical interplay in that, both humans and technologies are actively shaping each other.

The complexity of the relationships between human actors and technologies presents us with a problem; we need an analytical method to understand these networks, one which appreciates the complexities of their socio-technical nature and which, enables

humans and technologies to be considered within the same analytical platform.

3. AN APPROACH TO ANALYSIS

To address the analytical problems identified, we draw upon Actor Network Theory, a social science approach used extensively in the area of Science and Technology Studies (STS). ANT is a theory that explores the socio-technical networks that produce everyday outcomes. ANT provides an analytical framework which allows both human and non-human actors to be studied within the same domain, and which views the relationships that form between actors as the constructs of heterogeneous networks [3].

ANT's epistemological position aims to provide an analytical solution to the debate between constructivism and technological determinism [4]. By taking the middle ground, ANT focuses on how socio-technical networks are formed through the interactions of the actors. No *a priori* knowledge of the actors is assumed and it is only in the context of the network that actors gain agency and action occurs. ANT exposes a balanced view of a socio-technical environment, where all actors, including technologies, are considered equally. Callon [5] argues that ANT provides concepts and a method to describe the formation of a network of actors, which he refers to as the process of translation. He goes on to outline four stages, each corresponding to different activities and ways of interaction between the actors – in this process of translation: Problematisation, Interessement, Enrolment, and Mobilisation. Below we use these four stages to explore the LOD network

ANT has been used for a number of different information systems research studies [6-10] and also as the framework for numerous e-Government studies [11-13]. This research has provided insight into the process of network formations and to demonstrate barriers to the adoption of technology. We aim to apply ANT's conceptualisation of the process of translation to the network that has formed around the Linked Open Data community.

4. THE PROCESS OF TRANSLATION OF THE LOD COMMUNITY

The Linked Open Data community comprises of a vast number of actors, both human and non-human, with the common goal to achieve a Web where data is exposed, shared, connected, and accessible, made possible by the use of Semantic Web technologies such as Uniform Resource Indicators (URI) and Resource Description Framework (RDF) [14].

The diversity of the linked data community does not just involve academic, but commercial and governmental interests as well. A wide range of research has and continues to be conducted into the possible uses of linked data and the benefits that it provides. An important 'sub' community that has seen recent growth and public awareness is the use of Linked Data within the British government, the 'Open Government data' or 'Public Sector Information' (PSI) community. To explore the formation and adoption of the PSI community, we will apply the process of translation based on a number of key documents [15-17].

4.1 PROBLEMATISATION

The first stage of translation involves the focal actor identifying other actors and their potential interest in forming the network. The focal actor becomes the *obligatory passage point* (OPP), making themselves indispensable within the network [5].

If we consider the academics as the focal actors, focus must be given towards how they took such a position. Firstly, they are a large number of research groups who are active within the linked data and Semantic Web research community. As part of their work, they seek to explore and push the boundaries of computing, which results in publications and further funding. Although the use of Semantic Web technologies and government data has implemented in countries other than the UK, research is still in its infancy. These countries, including the UK have begun publishing their data to the public, advocating a transparent government to its citizens. In light of this, the academics can take advantage of the circumstances and produce publications which call for the use of Semantic Web technologies in combination with the Open Government data. It is this initial process that defines them as the focal actors, implicitly championing the idea of using Semantic Web Technologies with government data, not only to demonstrate their knowledge and expertise, but also enabling them to identify a number of other actors within this network. The academics are now

indispensable, becoming the obligatory passage point,

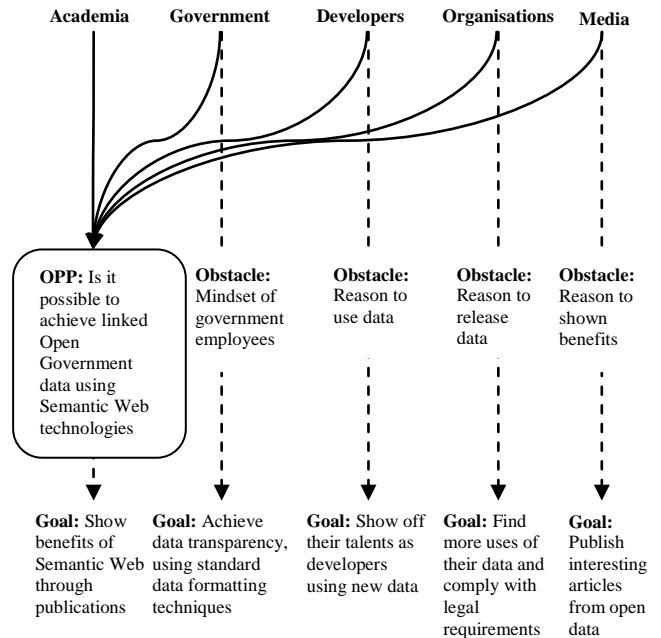


Figure 1 Obligatory Passage Point

shown in Figure 1.

During the Problematisation section, each of the actors within the network presents some interests and barriers to the overall stability of the network. Figure 1 illustrates these, which can be described as "*a system of alliances*" [5]. It is based on overcoming these obstacles through the relations that form within the PSI community that the common goal - achieving a linked Open Government using Semantic Web technologies - will be made possible.

4.2 INTERESSEMENT

The next stage of translation in the PSI community requires exploring how the entities within the network are interested in aligning together, successfully reaching a common goal. Entities do not form their goals and identities on their own, but rather as a result of the network effect, they are formed and are adjusted only during action [5].

The Interessement of achieving linked Open Government data can be explored by looking at how the academics use a number of devices to interest the other actors within the network. For actors such as the government and organisations, the use of documentation and examples of where using linked data has been successful and less resource (time, money) consuming than expected acts as an Interessement device. The developer's interests are captured by the academics by the demonstration of how the linked data can provide them with a data rich environment, allowing them to develop new

applications which were once not possible. Strengthening relations with the media is also performed by the academics promoting the advantages of Open Government data, explaining how transparency will provide the media with the ability to report news based on a wealth of government information.

Although the Interessement between the actors are important, based on the evidence [17,18], that the interest between the academics and the government play a large part within the network. Academics create strong relations with the government, which in turn makes them more influential within the network. This demonstrates the triangle of Interessement - the strong ties made between actors weaken others. However for all the entities involved, the Interessement stage aims to provide solutions to gaining enrolment of the actors. As a by-product of this, it disrupts potential competing associations which may inhibit the success of the network, in effect it is constructing a system of alliances [5].

4.3 ENROLMENT

For the network to be successful, the actors involved within the network must align together, forming alliances, leading to enrolment. Through successful Interessement, enrolment occurs, which can be described as a “*group of multilateral negotiations*” [5], supporting the Interessements and allowing them to succeed.

In the case of the PSI community, success is denoted by the acceptance of linked Open Government data by all the entities that have been identified in the network. Enrolment of each of the actors is required for this to occur. Government employees must accept change, and be willing to cooperate with the new ways of publishing and storing the information.

Resistance was identified [16] as a barrier during enrolment by the government, stemming from the worry about data misuse, expensive publishing costs, and concerns that changing to the new publishing format would cause inefficiencies and disruption to the existing infrastructure. However, through the devices of Interessement, namely, examples, statistics and software prototypes, the academics gained the enrolment of the government.

Enrolment of the organisations also posed a struggle, financial factors and disbelief of the linked data's added-value presented themselves as barriers. The academics tackled this by demonstrating how linked data provided the organisations with a number of benefits, from consistency checking, lower cost of

public data access and also the requests for providing better access to public sector data. Enrolment was also influenced by the immutable mobiles [5] within the network, the government standards/legislation acted as Interessement devices, enrolling the organisations to conform to the new standards of data transparency.

4.4 MOBILISATION AND STABILITY

By gaining alignment of all the actors in the network through different methods of Interessement, the goals that were first identified within the Problematisation stage of translation were met; linked Open Government data was achieved.

Through the alliances of the academics and the government, Data.gov.uk was released, providing a single access point for linked Open Government data. Councils were more forthcoming with the requirement to publically release their data, some even employing specific staff for such a task. Furthermore, mobilisation of the network was a result of enrolment of organisations and their relations with the government through the policies that were produced. Ordnance Survey published previously restricted geographic information to the public. Based on this mobilisation, the developers form alliances within the network, demonstrated by a number of applications which utilised the data that was available at Data.gov.uk.

The alignment of the discussed actors gained the agreement of the Media to form alliances within the network. Both the ‘*Guardian*’ and ‘*The Times*’ gained access to a number of news stories based on public spending or other open public data. The release of the Ordnance Survey data in combination with government data provided the media with visual statistics which gained the interest of their readers, thus raising their profile.

The PSI network it seems has reached stabilisation, a process that occurs after translation of the network. There is a continuous growth of linked government data and software being produced by developers. At the same time, the relations between the academics and the government are being reinforced by the release of new policies and legislation, which also strengthens the relations between the organisations and other actors within the network.

5. DISCUSSION

Using the conceptualisation of the process of translation we have uncovered a number of important findings regarding the formation of and relationships between actors within the PSI community. Academics have a much more central role within the network

compared with other actors; they appear to champion the majority of discussions and key meetings, spurring on and pro-actively developing the network. Due to their central role, triangles of Interessement occur, notable by the lack of discussion between the government and developers. The strength of the relationship between the academics-government and academics-developers makes the academics indispensible, but at the same time, limits the government-developer relationship.

Analysis of the Problematisation stage also exposes the exclusion of end-users as potential actors within the network and raises a number of questions about the purpose of the network, and its future stability. The explicit aim of Open Government data is to provide public access to once unpublished or hard to find data. However, it appears that end-users are not considered as important actors, rather as just the end users of the software produced. This potentially threatens the stability the network; LOD may be an exciting research venture for both academics and the government, but without users, it cannot be sustained.

6. CONCLUDING REMARKS

The process of translation uncovered the importance of the actors and the strong and weak ties between them. Exploring the UK PSI community through the lens of ANT highlights potential problems and missing actors, offering a different perspective on how the community grew and currently stabilised. Based on this we can address the call [1] to understand how other Open Government data initiatives function. Future work includes a comparative study of other PSI networks, exploring the barriers and enablers towards successful Open Public Sector initiatives.

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