Extending Open Data Platforms with Storytelling Features

Niall Ó Brolcháin
Insight Centre for Data Analytics
National University of Ireland, Galway
Ireland
niall.obrolchain@insight-centre.org

Lukasz Porwol
Insight Centre for Data Analytics
National University of Ireland, Galway
Ireland
lukasz.porwol@insight-centre.org

Adegboyega Ojo
Insight Centre for Data Analytics
National University of Ireland, Galway
Ireland
adegboyega.ojo@insight-centre.org

Tilman Wagner
Deutsche Welle, Bonn, Germany
tilman.wagner@dw.com

Eva Tamara Lopez
Deutsche Welle, Bonn, Germany
eva-tamara.lopez@dw.com

Eric Karstens
European Journalism Centre, Brussels, Belgium
karstens@ejc.net

ABSTRACT

[1] Research into Data-Driven Storytelling using Open Data has led to considerable discussion into many possible futures for storytelling and journalism in a Data-Driven world, in particular, into the Open Data directives framed by various governments across the globe as a means of facilitating governments, transparency enabled citizens and journalists to get more insights into government actions and enable deeper and easier monitoring of governments' work. While progress in the development of Open Data platforms (usually funded by national and local governments) has been significant, it is only now that we are beginning to see the emergence of more practical and more applied use of Open Data platforms. Previous works have highlighted the potential for storytelling using Open Data as a source of information for journalistic stories. Nevertheless, there is a paucity of studies into Open Data platform affordances to support Data-Driven Storytelling. In this paper, we elaborate on existing Open Data platforms in terms of support for storytelling and analyse feedback from stakeholder focus groups, to discover what methods and tools can introduce or facilitate the storytelling capabilities of Open Data platforms.

CCS CONCEPTS

• Information systems → Data management systems engines • Information systems → Collaborative and social computing systems and tools.

dg.o '17, June 07-09, 2017, Staten Island, NY, USA

ACM ISBN 978-1-4503-5317-5/17/06…$15.00
http://dx.doi.org/10.1145/3085228.3085283

KEYWORDS

Usable Open Data Platform, Data-Driven Storytelling, Data-Driven Journalism, Journalism, YDS Platform, Open Data

ACM Reference format:

N. Ó Brolcháin, L. Porwol, A. Ojo, T. Wagner, E. T. Lopez, E. Karstens. 2017. Extending Open Data Platforms with Storytelling Features. In *Proceedings of 8th Annual International Conference on Digital Government Research, Staten Island, NY, USA, June 2017 (DG.O 2017)*, 6 pages. http://dx.doi.org/10.1145/3085228.3085283

1 INTRODUCTION

Can the traditional news media survive in an increasingly Data-Driven world and will the quality and context of storytelling narratives change because of the ever-increasing availability of big data and open data platforms combined with ever more sophisticated means of dissemination and visualisation of that information? The European Commission (EC) Joint Research Centre (JRC) report, *Statistical, Ecosystems and Competitiveness Analysis of the Media and Content Industries: The Newspaper Publishing Industry*[2], shows that there has been a steady decline in newspaper circulation since the mid 1990's. This coincides with the increase in popularity of the internet. For example, the UK's Guardian has gone from a circulation of 494,000 in 1987 to 164,000 in 2016, this is a drop of 67%, while they have claimed on their website that "more people are reading the Guardian than ever but far fewer are paying for it". Newsworks[3] readership figures show a 26 million monthly readership for the Guardian with only 4 million reading the print edition. We can see declines in newspaper circulation right across all EU member states. As measured between 2002 and 2008 by the JRC report, we see the following declines (OECD, 2010), Denmark (-21%), the United Kingdom (-19%), the Netherlands (-18%) and Germany (-16%). While legacy broadcaster and newspaper websites are often amongst the most visited news websites, aggregators such

[2] http://ipts.jrc.ec.europa.eu/publications/pub.cfm?id=5380
[3] http://www.newsworks.org.uk/The-Guardian

as Google News[4], Yahoo News[5], Digg[6] and other online news providers are attracting increasing numbers of news readers.

In 2010 the European Journalism Centre (EJC) ran a roundtable in Amsterdam on Data-Driven Journalism which they identified as one of the big potential growth areas in the future of journalism. They claimed that one of the big goals in the storytelling process is to humanize statistics. While narrative content is consistent across widely divergent cultures and there is still a continuity of purpose that is consistent regardless of history or geography according to [11], the digital age is forcing us to evaluate the nature of storytelling [4] and how new technologies can be integrated into the process. Factual, digital and data based storytelling using multi-media technologies is evolving and is now absolutely necessary for helping the new generation to be successful in the 21st Century [8].

This paper explores the effectiveness of existing open data platforms in terms of support for storytelling and we analyse feedback from stakeholder focus groups to discover how storytelling features can best be used to extend open data platforms.

2 BACKGROUND

2.1 Data-Driven Storytelling

Data Storytelling or Data-Driven Storytelling (DDS) has emerged with the rapid proliferation of Open Data in the last 10 years. In principle DDS can be explained as a process of translating data analysis into simple, logical stories that can be understood by a non-technical audience[7]. S. Waisberg from Google Research argues that a meaningful story unlike any statistic is more memorable and more understandable[8]. Kosara and Mackinlay [7] argue that Data-Driven Storytelling is a natural next step for data analysis and visualization and a pivotal component for effective data exploration.

Data-Driven Journalism, or simply Data Journalism has emerged as a sub-domain of Data-Driven Storytelling and was propagated as a "buzzword" in 2010. In particular, the Data-Driven Journalism phenomenon received significant attention, after publication by the Guardian[9], the New York Times and Der Spiegel of a story on the Afghanistan war that was entirely based on data. Soon after that the first roundtable on Data-Driven Journalism was organized by the European Journalism Centre (EJC) in Amsterdam to discuss the status and the perspectives on new forms of journalism based on data. The results of the roundtable were gathered in a published report [5] which in principle sets up a new domain of Data-Driven Journalism (DDJ). The report discusses challenges and opportunities for data to be analysed and used in the newsroom setting. For this purpose, the journalists defined Data-Driven Journalism as a process including acquisition of data, filtering of data, visualization and publishing a Data-Driven story (Figure 1-the adaptation of the original DDJ process figure presented by [5]).

This process in its base requires data to be generated. In this context, the attention is turned towards Open Data and the major Open Data producers – Governments. Data journalism starts by exploring datasets on specific Open Data portals such as the European Data Portal or Eurostat. The data search and discovery stage is followed by the stage of filtering where only relevant data is elicited and then visualized. Finally, when the data is presented in an understandable way, the relevant story is built around the data. This can be achieved by elaborating about the data content in itself as well as identifying anomalies and analysing trends.

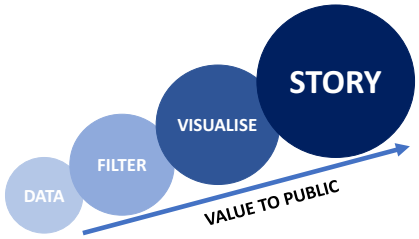

Figure 1: Data-Driven Journalism

2.2 Open Data for Storytelling

As explained in the previous section, Open Data has been one of the pillars of Data-Driven Storytelling. This important role of Open Data as a means of opening up the information held by governments and institutions to the public seems to bring back the original idea about the intended use of the Internet at its foundation. As the web has developed via CERN [2] and onwards to the era of the semantic web, big data analytics and collective intelligence [3] the evolution of the web of data [10] and the usage of public open data for providing trusted information became more and more relevant as a result of co-creational efforts between governments and supranational civil society organisations such as the Open Government Partnership[10], the Open Knowledge Foundation[11] and the Open Data Institute[12]. However, there is still a gap between the emerging proliferation of public open data and the ability of ordinary people to access and understand what information is actually relevant without suffering from information overload or receiving information in a form that is difficult to understand [1]. Open Data platforms and frameworks were created in order to provide Open Data to citizens in an accessible way. The platforms store and aggregate references to datasets (along with metadata with descriptions of the content) as well as providing relevant indexes facilitating identification and exploration of datasets of interest to users. In the next section, we discuss the

[4] https://news.google.ie
[5] https://www.yahoo.com/news
[6] http://digg.com
[7] http://searchcio.techtarget.com/definition/data-storytelling
[8] https://www.thinkwithgoogle.com/articles/tell-meaningful-stories-with-data.html
[9] https://www.theguardian.com/news/datablog/2010/jul/27/wikileaks-afghanistan-data-datajournalism
[10] http://www.opengovpartnership.org
[11] https://okfn.org
[12] http://opendata.institute

major Open Data platforms and their capacity to support the creation of Data-Driven stories as per the process described previously.

2.3 Open Data Platforms' Support for Storytelling

In our previous work, we carried out a study to examine the most popular Open Data platforms and categorise them in terms of their features, showing their strengths and weaknesses in terms of user requirements relating to Open Data storytelling. The best propagated Open Data platform is CKAN whose codebase is maintained by Open Knowledge International [13] (formerly Open Knowledge Foundation – OKF). Nevertheless that platform does not provide any specific support for storytelling in the base form. In all cases studied, we found a clear deficit in relation to storytelling capacity as can be seen in Table 1. It is clear that platforms like Publish my Data, Information Workbench, Junar, Open Data Soft or Semantic Media Wiki provide some support for storytelling. However the set of tools provided is poor and is considered insufficient for basic data-story telling requirements.

This finding was pivotal to initial works on the YDS platform which has been newly designed (based on a flexible Drupal[14] CMS Framework) with storytelling as a primary goal in the core platform design. Nevertheless, we envisage that the components, methods and tools developed as Open Source for the YDS platform can be reused or served as a template for developing relevant storytelling-extensions to existing Open Data platforms.

Table 1: Storytelling features in Open Data platforms

Platform	Publishing Workflow	Harvesting, Federation & Catalogue	Data Analysis	Visualisation	Storytelling Tools	Blogging Facility
CKAN	●	●	•	•	○	●
DKAN	●	●	●	•	○	●
Socrata	●	●	●	●	○	○
Publish my Data	•	•	○	○	•	●
Information Workbench	•	○	●	•	•	○
Enigma	•	○	●	○	○	•
Junar	•	●	•	●	•	•
Open Data Soft	•	●	•	●	•	●
Callimachus	•	•	○	○	○	○
Data Tank	•	○	●	○	○	○
Semantic Media Wiki	•	•	○	•	•	•

● Strong features
• Basic Features
○ No Features

[13] https://okfn.org
[14] https://www.drupal.org

3 METHODOLOGY

3.1 Context

The work presented in this paper is a part of an EU Horizon 2020 programme project – YDS. In the first stage of the project we have investigated stakeholder requirements in relation to storytelling with Open Data through various stakeholder focus groups.

Table 2: Focus Group Dimensions

Moderator	Participants	Environment	Analysis and Reporting
Skillful in group discussions	Carefully recruited	Comfortable	Systematic analysis
Uses pre-determined questions	5 to 10 people per group, 6-8 preferred	Circle seating	Verifiable procedures
Establishes permissive environment	Similar types of people	Water, drinks etc.	Appropriate reporting
	Repeated groups	Tape recording is optional	

A focus group is a type of group interview technique where a group of participants are carefully selected from specific population, social group or domain (relevant to the focus group - stakeholders)[12]. We leveraged a focus group as an instrument with a very specific domain focus (data storytelling) of the YDS project. Every focus group was conducted according to basic guidelines provided in the Focus Group Guide document released before we proceed to organise the workshops. The basic workshop guidelines are presented in **Table 2**. We have organised in total seven focus groups that have looked at scenarios relating to the extension of Open Data platforms with storytelling features. The details on date, location and targeted stakeholders in specific workshops are gathered in Table 3. The first workshop hosted in Bonn was of great significance as that workshop resulted in creating a framework that was a base for conducting the remaining workshops. We describe the framework in detail in the following section.

Table 3: Stakeholder Focus Groups

Date	Location	Targeted Stakeholders
23/03/2015	Deutsche Welle, Bonn, Germany	4 Journalists, 2 Data Journalists
25/03/2015	Dept. Finance, Government Buildings, Dublin, Ireland	1 Economist, 1 Data Journalist, 2 Citizens Reps, 1 Business Rep, 1 Academic, 5 Public Officials
14/12/2015	Deutsche Welle, Bonn, Germany	1 Graphic Designer, 1 Data Analyst, 1 Data Journalist
14/12/2015	European Journalism Centre (EJC), Maastricht, Netherlands	4 Journalists, 1 Developer
25/1/2016	Insight Centre for Data Analytics, NUI Galway, Ireland	11 Developers
18/1/2017	Harbour Hotel, Galway, Ireland	7 Public Officials, 2 Journalists
27/1/2017	Residence Palace, Brussels, Belgium	2 Data Journalists, 1 Public Official

3.2 YDS Framework

At the YDS Focus Group in Bonn, on 23rd March 2015 the participants created a five-tiered framework where they identified five main areas that should be facilitated by the YDS platform in support of data storytelling. The framework has been built around the main goal of Open Data-Driven Storytelling which builds a better trust in the government institutions through improved transparency. The participants argued that the four surrounding aspects identified are valid based on their expertise and rich experience in working with data and their ability and experience in engaging with the wider public as journalists. Therefore the finalised framework has been leveraged as a base for discussions in the subsequent workshops. The resulting framework has been presented in Figure 2, which is an adaptation of the original figure presented in the focus group report document (we specifically acknowledge Mirko Lorenz from Deutsche Welle who contributed to the creation of that framework). We also leverage this framework to present the consolidated results from the workshops. Now we briefly describe each of the tiers identified:

Discovery – deals with the affordance to assist users in finding, filtering, and identifying relevant evidence-based information on topics of interest.

Assistance – deals with helping users to harvest, process, analyse and visualise any datasets of interest, in a location, format, language, or other specific quality agnostic approach, served easily and intuitively.

Insight – addresses the need for users to understand information hidden in data - to translate and transform numeric, discrete values into a narrative that can be easily shared or published, creating a base for critical reflection (by comparisons, history, or any background information).

Figure 2: YDS Framework

Leverage – addresses the ability to connect and share findings with the wider public, to generate more supportive information (via crowd-sourcing) and validate the findings, as well as to create awareness of specific issues or problems identified, with potential impact on policy-making or transparency.

Trust – is the central principle of the framework. This tier reflects the key affordance to provide better transparency of data sources (and by implication by human or organisational sources), to include methods and tools for validation, verification and anomaly detection with specific metrics and indicators for trustworthiness provenance and credibility of the data presented. It is important to emphasise that the affordances were set in consideration of particular users including: the general public, users possibly without a strong technical background of varying expertise with Open Data, non-statisticians and non-developers.

4 RESULTS

In this section we present the results of the seven workshops conducted. We leverage the YDS framework presented in section 3 as an instrument to structure the results accordingly to the YDS platform affordances requirements. In particular, Table 3 includes the consolidated results valid across all the workshops. In the first row of the table we present the context for each of the tiers (example types). The further rows give specific suggestions coming from workshop participants.

Discovery - we can see many recommendations dealing with data harvesting, browsing, exploring and filtering. In principle, users want to be able to effectively "drill down" through data. For instance, if some aggregated data is provided for all the provinces in a country, an option to explore a specific province, county or city or specific entity (like public budget data) should be provided. Moreover, users want to be able to traverse and explore datasets easily with faceted browsing while being provided with rich metadata about the datasets, including information on provenance, completeness and possibly having highlights of anomalies and outliers. Also users want to see clear categorisation and structuration followed by the possibility of notifications whenever a new dataset of interest appears or is updated.

Assistance - gathers suggestions dealing with data processing. In particular users want to be able to aggregate, combine or merge datasets that are similar or complementary. Moreover, users expect some advanced data cleaning tools, as datasets are often "stained" by multiple errors and miss values. Also an instant data preview and automatic visualisations are seen as an important tool for processing data. Finally, users expect guidance and support for using the specific tools for processing the data.

Insight - presents recommendations related to data analytics. In particular users expect to be provided with tools that provide automatic validation and verification of operations performed over datasets (like data merging or aggregation validity). Moreover, specific visualisations are expected to be fine-tuned to the datasets explored. For instance GIS data should be preferably visualised with maps and financial data with graphs (like stock market charts) enriched with trends, maximum and minimum values marked. Additionally, users would expect some automatic narratives generation from data. This feature is considered as very important, especially for non-technical, non-mathematical users who may find "bare" statistics in form of discrete numbers or simple charts rather meaningless. Also, users want to be able to read the datasets creators commentaries and to engage with data-owners as well as other users who look at the same datasets. This feature is considered as social – explanatory, and of great benefit for better understanding of the content as well as

the intended use and context for which the specific datasets were created (some datasets created for specific contexts might not fit when moved to another context and combined with incompatible data – for instance, due to different data granularity). Finally a multilingual support is considered an important feature in increasingly multicultural societies.

Table 4: YDS Workshop Results

Discovery	**Assistance**	**Insight**	**Leverage**	**Trust**
...of data sources **...of anomalies** **...of story angles**	**Technical Handling** **Manage big datasets** **Usability** **Widgets API's**	**Data into stories** **Comparability of data** **Content** **Answers**	**User engagement** **Scaling up** **Achieve impact**	**Overarching** **Transparency** **Licensing**
Drill down functionality – browsing of datasets	Combining or merging datasets	Ensure that like is compared with like	Dissemination	Capacity of the platform to be transparent
Find, filter, and identify evidence-based information on any subject	Data cleaning	Forward planning capacity	Generate crowd-sourced information	Reference sources
Harvest data from multiple sources – acquiring data from multiple datasets	Background processing of datasets	Visualisation using graphs and mapping tools	Impact on policy-making, transparency, and the implementation of political or administrative decisions	Include mechanisms for verification
Metadata displayed on a single screen	Table with relevant metadata and other descriptive information	Data analysis	Create a greater public awareness of an issue	Trustworthiness indicator
Faceted browsing functionality with hierarchical structure of thematic categories	Instant visualizations	Transform numbers into a narrative story	Iterative process from data discovery via workbench to story telling	Continued stakeholder engagement
Well worked filter functionality	Preview of raw data	Critical reflection by way of comparisons	Required user expertise	Data provenance
Anomalies and outlier discovery	Data grading and relevance to the story	Provision of user friendly data analytics tools	Data publishing and tagging facilities	Licensing of data
Data categorization and classification	User help functionality	Context relating to data is important	Interactive canvas to allow users to write their own stories	Data usage statistics
Alert functionality for new data	Data linking tools	Quotations from data owners and notable people to accompany data sources	Provision of a closed group format	Data privacy features
	Mixing and aggregating data from multiple sources	Prepare stories to write and publish somewhere else	Facility to highlight good news stories with low news values	Data corroboration tools
	Provide online training for users	Multi lingual functionality	Sources to be attributable to all data and visual outputs	
	Customisation options using third-party templates or stylesheets		Compatibility and portability to other tools	

Leverage - refers to the suggestions and needs on sharing and discussing conclusions from data analysis, writing the body of Data-Driven stories, sharing and publishing the stories, therefore implicitly achieving an impact from data analysis. In principle users demand built in features for dissemination, generating crowd-sourced information around a specific story to rank and rate generated stories. These tools can help storytellers to estimate the validity and the potential of stories written in the context of usefulness and impact on policy making or administrative decision made. Users want to be able to spread the message to the public and receive feedback, especially from data owners and decision makers, therefore even more directly impacting policy-making.

Trust - refers to the overall suggestions on aspects related to improving data transparency while ensuring that privacy and other rights are respected. This is particularly strong when dealing with sensitive data like healthcare data. Data-storytelling platforms must ensure or minimise the possibility that any aggregation, merging or linking data can lead to de-anonymization of data (for instance where by triangulation of data across datasets specific individuals can be identified in an anonymised dataset). Moreover, users point out that data has to be trustworthy and the provenance has to be clear (with a possibility of provenance tracking).

If a dataset is altered or updated, specific information, and change tracking should be provided in metadata so that it is clear whether nobody manipulated the data in a way that renders the data to be invalid. Also, most of the licencing should be automatic or semi-automatic. Users have to be informed at all times about the permitted use of the specific datasets. Some use of data should be automatically restricted (for instance by not allowing the datasets to be aggregated or merged with other datasets). Again, all the changes in datasets and new datasets created by aggregation or merging should be validated and verified for potential privacy bridging or introducing misleading data or errors (like granularity, a warning could be raised if combined datasets have a different numerical granularity).

5 RESULTS VALIDATION

The results gathered in the YDS workshops, consolidated and analysed informed the requirement analysis and the development of the YDS platform. The project consortium after every workshop elicited the most feasible, new recommendations per each tier and implemented a selected set of features on the YDS platform. The subsequent iterations of the YDS platform were developed with an agile approach. The new version of the platform featuring new components recommended in previous workshops were evaluated in the workshop following the current version. The first validation of the results came in the form of a yearly project review by independent experts on behalf of the European Commission. It is important to note, that for the purpose of the review, we focused on financial data analytics (public spending) and comparisons between different EU states. The project has passed the first review successfully with the recommendation to continue with the project. The reviewers appreciated the tools developed and praised the advantage created by automated analytics, visualisations and real stories created around them. Therefore, we claim that our results and analysis provided a good basis for extending and improving the existing platform with capabilities to better support Data-Driven Storytelling. The current version of the platform can be visited and explored at the link provided[15].

6 DISCUSSION

In this paper, we presented an introduction to the "art of Data-Driven Storytelling". We elaborated on the dependency of storytelling with Open Data and we discussed the capacity of current Open Data platforms to support Data-Driven Storytelling. We showed that there is a need for strong innovation and improvement of the Open Data platforms to provide sufficient support for Data-Driven Storytelling. To address that challenge, we conducted a set of focus groups where Data-Driven Storytelling stakeholders discussed and elicited specific requirements for Data-Driven Storytelling support. We are aware of works aimed at evaluating Open Data platforms like the study by Kapoor et al. [6] or Parnia et al. [9]. Nevertheless, there is a paucity of studies that would explicitly address the affordances for Open Data platforms to support Data-Driven Storytelling or Data-Driven Journalism. We claim that our consolidated results, structured in a framework developed by the domain experts in a co-creation session, provide a good starting base for developing essential Open Data platforms improvements and extensions. We validated our results by implementing the features suggested in subsequent versions of our new Open Data Storytelling platform that was evaluated by workshop participants and the European Commission. The major limitation of this work is that the results presented here represent a relatively new domain and are part of research that is still evolving. Our results continue to be evaluated by our platform users and stakeholders participating in subsequent workshops. Future work should bring a hi-end complete prototype and an official Guide for Data-Driven Storytelling that will be used by data-storytellers and data-journalists to work on real world stories that will be published and are expected to generate significant policy-making impact.

[15] http://platform.yourdatastories.eu

7 CONCLUSION

Driven by the need to address the challenge of supporting Data-Driven Storytelling as a means of improving Open Data transparency and trust, we presented a study discussing the state of the art in Data-Driven Storytelling and provided valuable results of interest to Open Data platform designers and owners. In particular, our results enable better understanding of specific needs presented by Open Data-Driven storytellers and can inform design and development of the next generation of Open Data platforms that should include Data-Driven Storytelling as an important component essential for users to better understand the information hidden in datasets as well as to create a value based on Open Data and benefit Open Data itself by a detailed validation and data quality evaluation pivotal for evidence-based story-building.

ACKNOWLEDGMENTS

The work presented in this paper has been funded in part by the European Commission under grant number 645886.

8 REFERENCES

[1] Bawden, D. and Robinson, L. 2008. The dark side of information: overload, anxiety and other paradoxes and pathologies. *Journal of Information Science*. 35, 2 (2008), 180–191.

[2] Berners-Lee, T. et al. 2010. World-wide web: the information universe. *Internet Research*. 20, 4 (2010), 461–471.

[3] Buckingham Shum, S. et al. 2012. Towards a global participatory platform: Democratising open data, complexity science and collective intelligence. *European Physical Journal: Special Topics*. 214, 1 (2012), 109–152.

[4] Cassell, J. and Ryokai, K. 2001. Making space for voice: Technologies to support children's fantasy and storytelling. *Personal and Ubiquitous Computing*. 5, 3 (2001), 169–190.

[5] European Journalism Centre 2010. Data-driven journalism: What is there to learn? *Data-driven journalism roundtable, Amsterdam, 24 August 2010*. August (2010), 78.

[6] Kapoor, K. et al. 2015. Open data platforms and their usability: Proposing a framework for evaluating citizen intentions. *Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)* (2015), 261–271.

[7] Kosara, R. and MacKinlay, J. 2013. Storytelling: The next step for visualization. *Computer*. 46, 5 (2013), 44–50.

[8] Malita, L. and Martin, C. 2010. Digital storytelling as web passport to success in the 21st century. *Procedia - Social and Behavioral Sciences*. 2, 2 (2010), 3060–3064.

[9] Parnia, A. 2014. User Interface design for open data platforms. (2014).

[10] Sacco, O. et al. 2011. An Access Control Framework for the Web of Data. *2011IEEE 10th International Conference on Trust, Security and Privacy in Computing and Communications* (Nov. 2011), 456–463.

[11] Scalise Sugiyama, M. 2001. Food, foragers, and folklore: The role of narrative in human subsistence. *Evolution and Human Behavior*. 22, 4 (2001), 221–240.

[12] Thomas, L. et al. 1995. Comparison of focus group and individual interview methodology in examining patient satisfaction with nursing care. *Social Sciences in Health*. 1, 4 (1995), 206–220.