

## **“OpenGLAM” in Practice – How Heritage Institutions Appropriate the Notion of Openness**

**Beat Estermann**

Bern University of Applied Sciences, E-Government Institute, Bern, Switzerland  
E-Mail: [beat.estermann@bfh.ch](mailto:beat.estermann@bfh.ch)

### **Abstract**

The widespread digitization of heritage content and the increasing use of social media have triggered some heritage institutions to increasingly open up collections and work processes for participation from the outside, as exemplified by open data/open content, linked data, or collaborative content creation. In the present paper we analyze to what extent progress in digitization and the uptake of social media use can be expected to result in an ‘opening up’ of institutions on a wider scale (opening up of information and content for re-use, opening up of decision-making processes, or co-production). For this purpose, the links and mutual influences between various Internet-related practices as well as their dependency on context factors (GDP, E-Participation Index, and the effectiveness of skills acquisition among heritage institutions of a given country) have been investigated through regression analysis. We show what it means for the institutions to open up their data/content, to use social media to reach their audiences, or to pursue crowdsourcing approaches, by analyzing their goals and motivations, by examining the way they picture their relationship with their publics, and by analyzing the changes in their perceptions as they actually implement these practices on a wider scale. For our analyses we draw on the data collected in a survey among heritage institutions in nine countries, focusing on questions related to the diffusion of digitization, social media use, open and linked data, open content, and crowdsourcing in the heritage sector.

### **Key words**

heritage institutions, digitization, social media, open data, crowdsourcing, linked data, innovation diffusion

## INTRODUCTION

In the context of widespread adoption of open government data policies and propagation of ‘open government’ and ‘open governance’, this article sheds light on a sector that is adjacent to classical public administration: the cultural heritage sector. While some heritage institutions (galleries, libraries, archives, museums) are governed by public law, many others are constituted as private non-profit organizations, a large fraction of which are mainly publicly funded and thus directly affected by public funding policies. The emerging collaborative culture on the Internet provides heritage institutions with new opportunities, but creates also new challenges for them. Some of the new emerging practices can be subsumed under the term ‘OpenGLAM’, the equivalent of ‘open government’, applied to the cultural heritage sector. By means of an international benchmark survey, carried out among heritage institutions in Brazil, Bulgaria, Finland, New Zealand, Poland, Portugal, Switzerland, The Netherlands and Ukraine, the adoption of various Internet-related practices, such as social media use, digitization, open data/open content, collaborative content creation, and the publication of linked data, has been studied. Driving forces and hindering factors as well as the organizations’ characteristics favoring the adoption of practices have been identified in earlier publications (Estermann 2015, Estermann *forthcoming*). In the present paper we are taking a closer look at the interactions between the various practices in order to study their inter-relationships. Furthermore, we extend the analysis by including two macro-level context factors (GDP and E-Participation Index) and a meso-level context factor (effectiveness of skills acquisition among the heritage institutions of a given country) in order to deepen our insights into country differences. After this thorough analysis of the factors influencing the adoption of the various Internet-related practices, we go on to examine the institutions’ attitudes regarding the purpose as well as the pros and cons of the adoption of social media use, ‘open content’, and ‘collaborative content creation’. In order to get an idea of how notions of ‘openness’ and ‘participation’ diffuse throughout the heritage sector, we analyze how attitudes of institutions which find themselves at different adoption stages of the various practices differ from each other.

## **DEFINITION OF CORE CONCEPTS**

Before we get into the details of the methodological approach, we would like to clarify a few core concepts used in the context of this article, such as ‘OpenGLAM’, ‘open data’, ‘open content’, ‘linked open data’, and ‘crowdsourcing’, as well as the theory of innovation diffusion that serves as our primary theoretical lens:

### **OpenGLAM**

The term ‘OpenGLAM’ is used by the Open Knowledge Foundation as a rough equivalent of ‘Open Government’, but applied to the cultural heritage sector. The acronym ‘GLAM’ stands for ‘*galleries, libraries, archives, and museums*’ and is used to refer to heritage institutions in general. According to the introduction to the Open Knowledge Foundation’s ‘OpenGLAM Principles’ (OKFN 2013), the objective of ‘OpenGLAM’ consists in encouraging heritage institutions to seize the opportunities offered by the Internet by engaging ‘global audiences’, by making their collections ‘more discoverable and connected than ever’, and by allowing users ‘not only to enjoy the riches of the world’s memory institutions, but also to contribute, participate, and share’. The principles themselves focus on aspects of openness, in the sense of the Sunlight Foundation’s definition of ‘open data’ (see below), and on ‘novel ways of engaging audiences on the web’, i.e. various forms of e-participation.

### **Heritage institutions**

In the context of our survey we followed the definition of the ENUMERATE project, which has defined the cultural heritage domain to consist of the ‘memory institutions’, such as museums, libraries, archives and records offices, audio-visual and film archives, organizations with curatorial care for monuments, sites and the historic environment, as well as hybrid types of organizations. The defining criterion of a ‘heritage institution’ is that ‘curatorial care for, at least part of, the collections of the institution are included in its mission (Nauta et al. 2011, p. 5).

## **Open data / open content**

The open data movement experienced its worldwide breakthrough around 2009 when the Obama Administration and the UK Government adopted *Open Government Data* policies in order to promote transparency, participation, and collaboration between politicians, public authorities, private enterprises, and citizens. In its general form, the term ‘data’ includes all kinds of data: study reports, maps, satellite photographs, pictures and paintings, weather data, geographical and environmental data, survey data, the genome, medical data, or scientific formulas. In the heritage sector, a distinction is however frequently made between ‘data’ and ‘content’: while the term ‘data’ is generally used to designate different types of metadata, such as catalogues, inventories, finding aids, glossaries, vocabularies, or name authority files, the term ‘content’ is used to refer to digital versions of heritage objects.

According to the Sunlight Foundation’s ten Open Data Principles (Sunlight Foundation 2010), which serve the open data movement as a reference, data are considered as ‘open’ if they can be re-used, modified and distributed by anybody for any purpose at no cost. In order to facilitate re-use, the data need to be made available in a machine readable format, i.e. as structured data. Typically, open data or content that is subject to copyright protection is made available under a ‘free’ copyright license, which allows users to freely modify and to re-distribute a work.

## **Linked open data**

While the call to open up public sector information can be seen as a logical extension of the freedom of information regulations that have been adopted by many countries since the 1990ies, the open data movement is also driven by a technical and economic vision: a semantic web is to be created by linking many ‘open’ datasets from various sources. Thus, ‘linked open data’ will serve as an infrastructure resource for third parties to build value-added services on top of it, such as new combinations of data, visualizations, or other data-driven services (Bauer & Kaltenböck 2011, Jankowski et al. 2009).

## **Crowdsourcing / collaborative content creation**

The term ‘crowdsourcing’ was coined by Jeff Howe in 2006 in Wired Magazine, by combining the two terms ‘crowd’ and ‘outsourcing’. The term has since been used with somewhat varying definitions; Estellés-Arolas and González-Ladrón-de-Guevara have compared forty original definitions of crowdsourcing in order to propose a comprehensive one:

*“Crowdsourcing is a type of participative online activity in which an individual, an institution, a non-profit organization, or company proposes to a group of individuals of varying knowledge, heterogeneity, and number, via a flexible open call, the voluntary undertaking of a task” (Estellés-Arolas & González-Ladrón-de-Guevara 2012, p. 9).*

In our survey, the term ‘collaborative content creation’ is used alongside ‘crowdsourcing’ to refer to collaborative activities taking place within online communities, such as the Wikipedia community.

## **Innovation diffusion**

For more than half a century, scholars in various fields have studied how and under which conditions innovations spread through social systems. According to Everett M. Rogers, who has popularized the innovation diffusion approach, ‘*an innovation is an idea, practice, or object that is perceived as new by an individual or other unit of adoption*’ (Rogers 2003, p. 36). The diffusion of an innovation is a social process that unfolds as the members of a social system get acquainted with an innovation and go through the innovation decision process. Thereby, ‘*an individual (or other decision-making unit) passes from first knowledge of an innovation, to the formation of an attitude toward the innovation, to a decision to adopt or reject, to implementation and use of the new idea, and to confirmation of this decision*’ (Rogers 2003 p. 20). In the present paper, as well as in preceding papers (e.g. Estermann 2015), we use the ‘innovation diffusion’ approach as a theoretical lens to study where heritage institutions stand with regard to the adoption of various innovative practices. In the present paper we mainly refer to the innovation adoption process which has been widely described as comprising different, successive stages, although the number of stages, their precise definition, and their naming varies according to the authors. The stage model

developed by Beal and Bohlen (1957) comprises five distinct stages of innovation adoption: awareness stage, interest stage, evaluation stage, trial stage, and adoption: At the *awareness stage*, agents become aware of some new idea, but lack details concerning it. At the *interest stage*, they are seeking more information about the idea, and at the *evaluation stage*, they make a mental trial of the idea by applying the information obtained in the previous stage on their own situation. At the *trial stage*, they apply the idea in a small-scale experimental setting, and if they decide afterwards in favor of a large-scale or continuous implementation of the idea, they have reached the *adoption stage*. The stage model was originally developed in order to understand the innovation adoption process of individuals. When applied to organizations, it has to be kept in mind that individual organizations may not pass through the stages in a linear fashion, but may move back and forth between stages in a process that is characterized by shocks, setbacks, and surprises (Greenhalgh et al. 2004).

## **METHODOLOGY OF DATA COLLECTION**

### **Survey instrument**

The questionnaire used for the survey contains 34 questions (for a more detailed account of the questionnaire elaboration process, refer to Estermann 2015): Ten questions relate to the institution's characteristics, such as the type of institution, the most characteristic type of heritage items, its main users, its geographical reach, the number of employees and volunteers, its annual revenues, the composition of revenue sources, and the institution's legal form. Two questions concern the assessment of various practices related to the Internet, regarding their importance for the institution and the institution's evaluation of risks and opportunities. Two questions address the availability of metadata in form of open data and linked data respectively, while two further questions focus on the digitization of heritage objects. Seven questions cover various aspects of open content: conditions under which the institution is ready to make its content available on the Internet without receiving payment in exchange, the copyright situation of the objects in the institution's collection, the percentage of objects published as open content, copyright licenses used to make content available as open content, as well as benefits, challenges, and risks related to open content. Two questions relate to the use of social media, while four questions cover various aspects of crowdsourcing, such as staff involvement in collaborative content creation by online communities, crowdsourcing approaches used, as well as the purpose, risks and challenges of crowdsourcing. Four questions address the skills and know-how of the staff in the areas covered by the survey as well as the institution's need for further information, training, and external consulting. And finally, the last question asks the survey participants to list the professional role(s) of the people who have responded to the questionnaire. Several questions are conditional questions, and some weren't included in all the countries.

### **Sampling approach and response rates**

In each country we attempted to invite all the known heritage institutions to participate in the survey. The availability of lists of heritage institutions varied from country to country, so that distribution lists for the

different countries contained between ca. 60% and more than 90% of all heritage institutions. Judging by the number of institutions included in the distribution lists, it appears that there are stark differences between the countries regarding the structure of the heritage domain, even when accounting for methodological differences in the way the distribution lists have been assembled (Estermann 2015).

The overall response rate for the nine countries was 11.3%. There were however significant differences among the various countries: The highest response rate has been observed in Finland (25.8%), followed by Switzerland (19.5%). The lowest response rates have been registered for Brazil (6.3%) and Bulgaria (10.4%) (see Estermann *forthcoming* for further details).

## **Limitations**

As pointed out by Estermann (*forthcoming*) the main limitations of the survey are related to the methodological challenges posed by the heterogeneity of the heritage sectors in the participating countries and the stark differences regarding the responding behavior of institutions across countries. The findings presented in this article are based on a combined sample of 1030 institutions from 7 European countries (Bulgaria, Finland, Poland, Portugal, Switzerland, The Netherlands, and Ukraine), Brazil and New Zealand. The survey therefore allows for relatively robust findings regarding the European heritage sector (N = 791) and gives a first glimpse of the differences that may occur with regard to other parts of the world.

## **RESEARCH QUESTIONS AND METHOD OF ANALYSIS**

Figure 1 shows the present state of the diffusion of the various Internet-related practices within the heritage sector (see Estermann *forthcoming* for a detailed account of the operationalization of the various concepts). In our earlier paper we have also started to investigate the factors that influence the adoption of the various practices taken separately (see figure 2: ‘x’ denotes a comparatively weak correlation between the independent and the dependent variable, while ‘xx’ denotes a strong correlation). In the present paper we take this analysis a step further by examining the impact the adoption of some practices may have on



the likelihood to take up other practices later on, and by replacing the country variable by more specific country-level variables. In addition, we will look at the changes in attitudes as the institutions transit through different stages of the innovation adoption process. This will allow us not only to account for the factors influencing the adoption of the various practices, but also to describe the changes in attitudes relevant to OpenGLAM that accompany the adoption of the various practices.

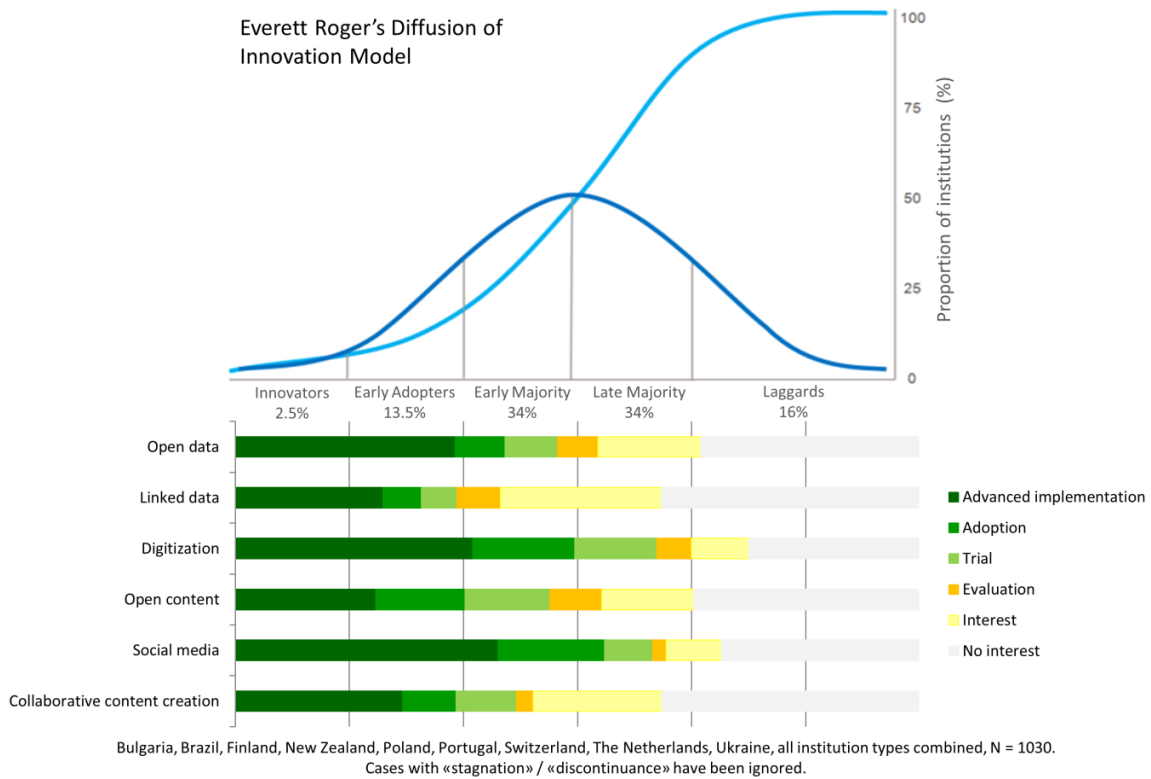


Figure 1: Diffusion of Internet-related practices among heritage institutions

Ordinal Logistic Regression – Synthesis of Results						
Independent Variable(s)	Open Data	Linked Data	Digitization	Open Content	Social Media Use	Collab. Cont. Creation
Country	++	++	++		++	++
Institution Type			++			
Typical Objects	+		++			
Main Users						
Geographical Reach					++	
Size (paid FTE)					++	
Size (revenues)						
Pct of Volunteers in Workforce					++	+
Revenue Sources						
Form of Organization	+					
Number of Metadata Types	++	++	++	+		
Skills / Skills Acquisition	++	++	++	+	++	++
Attitudes reg. Open Content		+		++		

Figure 2: Factors influencing the adoption of various Internet-related practices

## Research questions

The research questions tackled in the present article can therefore be summarized as follows:

- What are the links and mutual influences between various Internet-related practices among heritage institutions? Is there a typical path heritage institutions follow when adopting the practices under examination?
- Which context factors at the country level influence the adoption of the various practices?
- To what extent do attitudes with regard to the different practices change as heritage institutions transit through the various stages of the innovation adoption process?

## Method of analysis

In order to address the first two questions, we proceeded in three steps:

- In the first step, we extended the regression models for each of the six practices (use of social media, digitization, open data, open content, collaborative content creation, and linked data) presented in Estermann (*forthcoming*), by introducing the adoption rates of the practices that are more widespread than the practice under examination. By this means it is possible to establish to what extent practices that are more widespread than others tend to constitute a prerequisite in view of the adoption of other, presently less widespread practices. Given the advancement of the diffusion of the various practices, the following variables were introduced into the models: the adoption of ‘digitization’ and social media use were entered into the regression models for all the other practices, and the adoption of ‘open data’ was entered into the regression models of ‘linked data’ and ‘collaborative content creation’. In this step, a cumulative ordinal regression model was used, which assumes that the influence of the independent variables stays the same for each adoption stage (assumption of proportional odds). As established by a full likelihood ratio test comparing the residual of the fitted location model to a model with varying location parameters, this assumption was met in the case of the models for the adoption of social media use, for the adoption of ‘linked data’ and for the adoption of ‘collaborative content creation’. In the case of the model for the adoption of ‘open content’ the assumption was met as long as the variables relating to the conditions under which the institution is ready to make its content available on the Internet without receiving payment in exchange were not entered into the model. The assumption of proportional odds was however not met in the case of the models for the adoption of ‘digitization’, ‘open data’, and ‘open content’ (if the aforementioned variables were entered into the model).
- In a second step, we introduced country-level context factors to replace the country variables. Thereby a series of macro-level indicators were taken into consideration, such as GDP, unemployment rate, public debt, the Human Development Index (HDI), the E-Government

Development Index (EGDI), the E-Participation Index (EPI), the ICT Development Index (IDI), the KOF Index of Globalization, and the Happiness Score (“subjective well-being” from the World Happiness Report). Given the high correlations between many of these indicators (which are an impediment to regression analysis), we finally settled for two indicators which turned out to be quite independent from each other when looking at the nine countries under consideration and promised some explanatory power given the distribution of their values across countries: the GDP, and the E-Participation Index (EPI). As the correlation table (table 1) shows, the GDP is very strongly correlated with the Human Development Index and the ICT Development Index, and rather strongly correlated with Subjective well-being, the KOF Index of Globalization, and the unemployment rate. Both indicators are also quite strongly related to the E-Government Development Index. The somewhat arbitrary nature of the selection of the indicators should be kept in mind when analyzing the results: in fact, in our models GDP may just function as a proxy for ICT Development or subjective well-being. Given the important role of skills or skills acquisition with regard to the adoption of the various practices as it appeared from the initial ordinal regressions (see figure 2), we also introduced a meso-level variable into the regression models: the overall effectiveness of the use of different methods of skills acquisition by the heritage institutions of a given country, as it appears from the survey data. As can see in table 1, this variable is quite strongly (negatively) correlated with the GDP; however, when testing for multicollinearity issues, it turned out that VIF values were relatively small (below 10), indicating that it was acceptable to use both variables in the same regression model. In this step, we again used a cumulative ordinal regression model that comes with the limitations mentioned above, given that the assumption of proportional odds wasn’t met for all the models.

Correlations

		GDP per capita (2012, in 10'000 USD)	Unemployment rate (2012, in %)	Public debt (as % of GDP)	Human Development Index (2014)	E-Government Development Index (2014)	E-Participation Index (2014)	ICT Development Index (2015)	KOF Index of Globalization (2015)	Subjective well-being (2012-2014)	Effective use of four basic methods of skills acquisition (by the country's heritage institutions)
GDP per capita (2012, in 10'000 USD)	Pearson Correlation	1	-.613**	-.107**	.892**	.570**	-.285**	.889**	.670**	.711**	-.518**
	Sig. (2-tailed)		.000	.001	.000	.000	.000	.000	.000	.000	.000
	N	1028	1028	1028	1028	1028	1028	1028	1028	1028	924
Unemployment rate (2012, in %)	Pearson Correlation	-.613**	1	.617**	-.356**	-.189**	.103**	-.389**	.033**	-.773**	.340**
	Sig. (2-tailed)	.000		.000	.000	.001	.000	.000	.296	.000	.000
	N	1028	1028	1028	1028	1028	1028	1028	1028	1028	924
Public debt (as % of GDP)	Pearson Correlation	-.107**	.617**	1	.042	.197**	.323**	.041	.323**	-.263**	-.150**
	Sig. (2-tailed)	.001	.000		.179	.000	.000	.184	.000	.000	.000
	N	1028	1028	1028	1028	1028	1028	1028	1028	1028	924
Human Development Index (2014)	Pearson Correlation	.892**	-.356**	.042	1	.811**	-.022	.980**	.878**	.612**	-.395**
	Sig. (2-tailed)	.000	.000	.179		.000	.482	.000	.000	.000	.000
	N	1028	1028	1028	1030	1030	1030	1028	1028	1028	924
E-Government Development Index (2014)	Pearson Correlation	.570**	-.189**	.197**	.811**	1	.531**	.860**	.754**	.613**	-.063**
	Sig. (2-tailed)	.000	.000	.000	.000		.000	.000	.000	.000	.056
	N	1028	1028	1028	1030	1030	1030	1028	1028	1028	924
E-Participation Index (2014)	Pearson Correlation	-.285**	.103**	.323**	-.022	.531**	1	.058	.039	.192**	.353**
	Sig. (2-tailed)	.000	.001	.000	.482	.000		.064	.211	.000	.000
	N	1028	1028	1028	1030	1030	1030	1028	1028	1028	924
ICT Development Index (2015)	Pearson Correlation	.889**	-.389**	.041	.980**	.860**	.058	1	.837**	.699**	-.416**
	Sig. (2-tailed)	.000	.000	.184	.000	.000	.064		.000	.000	.000
	N	1028	1028	1028	1028	1028	1028	1028	1028	1028	924
KOF Index of Globalization (2015)	Pearson Correlation	.670**	.033**	.323**	.878**	.754**	.039	.837**	1	.224**	-.319**
	Sig. (2-tailed)	.000	.296	.000	.000	.000	.211	.000		.000	.000
	N	1028	1028	1028	1028	1028	1028	1028	1028	1028	924
Subjective well-being (2012-2014)	Pearson Correlation	.711**	-.773**	-.263**	.612**	.613**	.192**	.699**	.224**	1	-.318**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	.000		.000
	N	1028	1028	1028	1028	1028	1028	1028	1028	1028	924
Effective use of four basic methods of skills acquisition (by the country's heritage institutions)	Pearson Correlation	-.518**	.340**	-.150**	-.395**	-.063**	.353**	-.416**	-.319**	-.318**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.056	.000	.000	.000	.000	
	N	924	924	924	924	924	924	924	924	924	924

\*\* Correlation is significant at the 0.01 level (2-tailed).

Table 1: Correlations between various macro-level indicators

- In order to overcome the shortcomings of the ordinal regression model we applied a multinomial model which doesn't assume the impact of the independent variables on the dependent variable to be uniform across the various adoption stages. To do so, we broke the adoption process down into three stages ("no interest / interest"; "evaluation / trial"; and "adoption / advanced implementation") and examined the effect of the various independent variables for each of the two steps separately. In the models regarding the adoption of 'digitization' and 'collaborative content creation', the variable indicating whether private individuals count among the main users of the institution had to be excluded from the analysis in order to avoid a quasi-complete separation in the data. In the case of the adoption of 'digitization', the variables indicating the overall skills level and the overall satisfaction with the effectiveness of skills acquisition had to be excluded for the same reason. There were no collinearity issues. The final models statistically significantly predicted the dependent variables

over and above the intercept-only models, with very good results for all models (with p-values below .001). The Nagelkerke pseudo R-square statistics, which gives an indication of the proportion of variance that can be explained by the models, was .357 for the ‘digitization’ adoption model, .503 for ‘social media use’, .574 for ‘open data’, .397 for ‘open content’, .388 for ‘collaborative content creation’, and .485 for ‘linked data’.

In order to address the third research question, we ran comparative analyses between institutions at various adoption stages. The attitudes considered were: perceived importance and perceived desirability of various practices (comparison along the adoption stages of all Internet-related practices taken individually); reasons not to digitize important parts of an institution’s holdings (comparison along the adoption stages of digitization); conditions under which an institution is ready to make its content available on the Internet without receiving payment in exchange (comparison along the adoption stages of digitization, social media use, and open content); purpose of the use of social media (comparison along the adoption stages of social media use); benefits, challenges, and perceived risks of open content (comparison along the adoption stages of open content); purposes and perceived risks of collaborative content creation (comparison along the adoption stages of collaborative content creation). By this means we tried not only to describe the changes in perception of the importance and desirability (opportunities vs. risks) of the various practices, but also to identify possible shifts in the perception of a given practice as institutions adopt it on a wider scale.

## **FINDINGS**

Figure 3 gives an overview of the results from the ordinal logistic regression analysis (step 2). As noted above, the results should be taken with a grain of salt as the assumption of proportional odds wasn't met for all the dependent variables. What appears however clearly, is the inter-relationship between the 6 practices under consideration: The data suggests that the adoption of 'social media use' generally precedes the adoption of 'collaborative content creation' and of 'open content'. Similarly, the adoption of 'digitization' precedes the adoption of 'open content' and of 'open data', while 'open data' appears to be a prerequisite for 'linked data'. It should also be noted that when controlling for these inter-relationships, country differences regarding the adoption of 'collaborative content creation' and 'linked data' disappear altogether (compare with figure 2). They persist however for the adoption of 'social media use', 'digitization', and 'open data'. Surprisingly, a higher GDP appears to be associated with a lower uptake of 'social media use' while the effective use of different methods of skills acquisition by a country's heritage institutions appears to be associated with a lower adoption level of digitization. These findings are for the least counter-intuitive and call for further discussion. As expected, a country's higher level on the E-Participation Index is associated with higher adoption rates of 'social media use', 'digitization', and 'open data'.

So much about the overall picture as it appears on the basis of the results of the ordinal logistic regression analysis. Let us now turn to the results of the multinomial regression analysis.

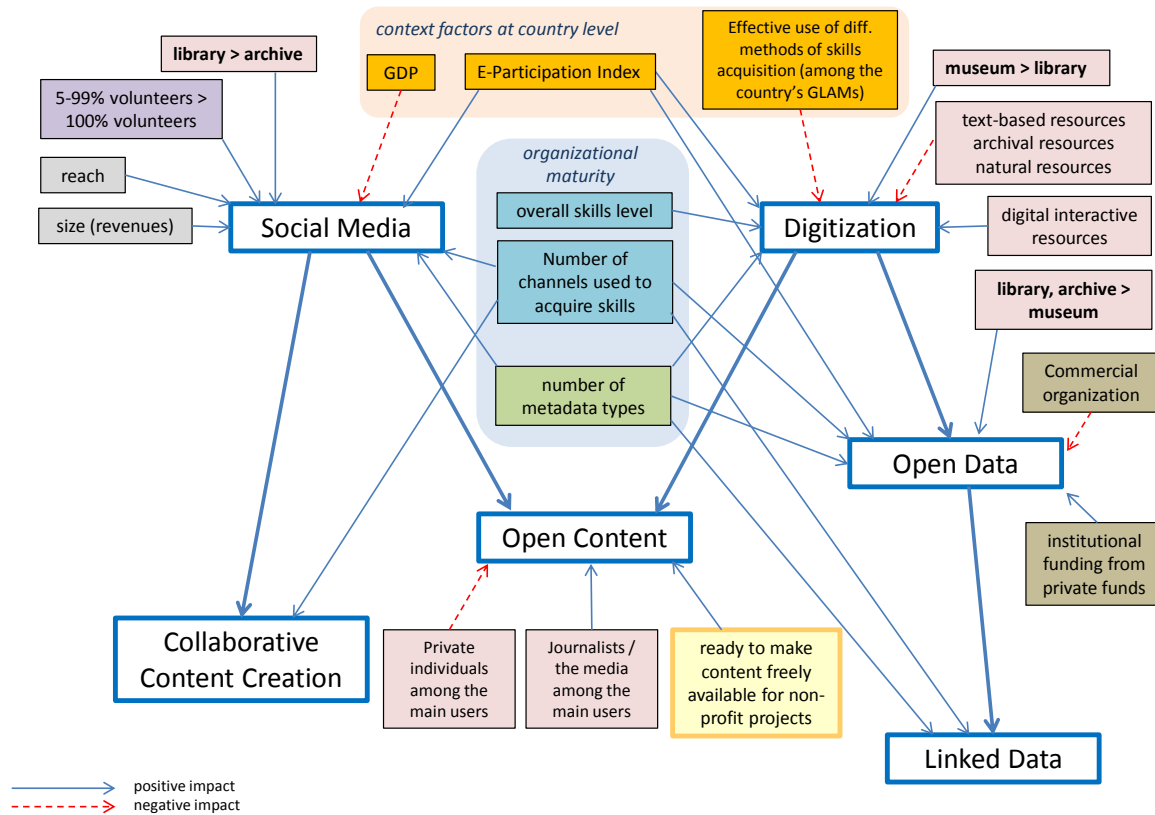


Figure 3: Factors influencing the adoption of various Internet-related practices (based on ordinal logistic regression analysis)

## Factors favoring the adoption of digitization

When comparing institutions at the ‘no interest/interest’ stage to institutions at the ‘evaluation/trial’ stage of digitization, the following observations have been made (see the annex for the detailed results of the multinomial regressions):

- The presence of a higher number of metadata types positively influences the initial steps towards the adoption of digitization: An increase in the number of different metadata types present in an institution, such as ‘catalogues, inventories, finding aids’, ‘glossaries, vocabularies, ontologies’, and ‘name authority files’ (expressed on a scale from 0 to 3) was associated with an increase in the odds of being at the ‘evaluation/trial’ stage, with an odds ratio of 1.662.



- The presence of public authorities among the main users of the institution also has a positive impact: The odds of institutions which don't count public authorities among the main users were 0.179 times that of other institutions.

When comparing institutions at the 'evaluation/trial' stage to institutions at the 'adoption/advanced implementation stage' of 'digitization', a series of influencing factors have been identified. 'Adoption/advanced implementation' was found to be:

- positively related to a higher number of methods used for skills acquisition, as measured on a scale from 0 to 2 (odds ratio: 1.596);
- positively related to a higher number of metadata types, as measured on a scale from 0 to 3 (odds ratio: 1.370);
- positively related to a higher E-Participation Index, expressed on a continuous scale ranging from 0 to 1 (std. deviation: 0.216; odds ratio: 17.118);
- more likely among museums than among libraries (odds ratio: 5.678);
- positively related to the absence of natural resources among the heritage objects that are characteristic for the institution (odds ratio: 2.140); positively related to the presence of digital interactive resources among the heritage objects that are characteristic for the institution (odds ratio: 0.414);
- positively related to the presence of educational institutions among the main users of the institution (odds ratio: 0.493)
- more likely in the case of institutions reporting annual revenues between 500'000 and 1 mio. €, compared to institutions reporting annual revenues above 1 mio. € (odds ratio: 2.769).

When looking at the reasons not to digitize substantial parts of an institution's holdings, it can be observed that 'lack of funding' constantly ranks highest (with average values between 4.2 and 4.8 on a scale from 1 to 5) along all the adoption stages (differences are not significant at a 0.05 level). Reasons number 2 and 3 are 'lack of qualified staff' (with average values between 3.2 and 4.0) and 'lack of volunteers' (with

average values between 3.5 and 2.4). In both cases, average values tend to decrease for more advanced adoption stages; in the case of ‘lack of volunteers’ this effect is statistically significant. The reasons ‘digitization is not part of our mission’ and ‘low demand for particular digitized objects’ rank rather high among the institutions that haven’t digitized any holdings yet (with average values up to 3.6 and 3.7), while they are considerably lower (1.7 and 2.5) for institutions at the ‘advanced implementation’ stage. Other reasons not to digitize substantial parts of an institution’s holdings are rather constant at comparatively low levels (see Estermann *forthcoming* for further details).

### **Factors favoring the adoption of social media**

When looking at the adoption of social media use, the following factors appeared to play a role at the inception of the adoption process. The fact of an institution being at the ‘evaluation/trial’ stage instead of the ‘no interest/interest’ stage appeared to be:

- positively associated with a higher E-Participation Index (std. dev.: 0.216; odds ratio: 26.783);
- negatively associated with pure volunteer organizations (with odds ratios of 9.769 and 5.723 respectively for institutions with a mix of volunteers and paid staff and institutions without volunteers, compared to institutions without paid staff).

When looking at the step from ‘evaluation/trial’ to the ‘adoption/advanced implementation’ stage, the fact that an institution is in the more advanced category appeared to be:

- positively related to wider geographical reach of the institution, as measured on a scale ranging from 1 to 4 (odds ratio: 1.794);
- positively related to the size of the institution in terms of number of paid staff (std. deviation: 69; odds ratio: 1.032);
- positively related to a higher number of methods used for skills acquisition (odds ratio: 1.596);
- positively related to the absence of archival resources among the heritage objects that are characteristic for the institution (odds ratio: 2.286).

## **Factors favoring the adoption of open data and open content**

The inception of the adoption process regarding ‘open data’ appeared to be:

- positively related to a higher number of volunteers working for the institution (std. deviation: 24; odds ratio: 1.037);
- positively related to a higher number of metadata types (odds ratio: 8.738).

The transition from the ‘evaluation/trial’ stage to the ‘adoption/advanced implementation’ stage turned out to be:

- positively related to a “sufficient” overall skills level, expressed in form of a dichotomous variable (odds ratio: 2.677);
- positively related to a higher E-Participation Index (std. deviation: 0.216; odds ratio: 10.413);
- more likely to happen in the case of libraries, compared to other institution types (odds ratios: 0.148 for museums, 0.239 for mixed forms, and 0.278 for archives)

The inception of the adoption process regarding ‘open content’ appeared to be:

- positively related to a higher number of metadata types (odds ratio: 1.467);
- positively related to higher adoption levels regarding digitization (odds ratio 1.427) and social media use (odds ratio: 1.367);
- More likely to take place in the case of institutions of a mixed type (combination of archive, museum, and/or library) than in the case of museums (odds ratio: 3.211).

In addition, there were weak associations for two further variables, suggesting that institutions which do not count private individuals among their main users may be more likely to take the initial steps towards the adoption of ‘open content’ than those which do (odds ratio: 5.762); and that institutions which do not count research institutions/specialists among their main users may be more likely to take the initial steps towards the adoption of ‘open content’ than their counterparts (odds ratio: 1.864).

When it comes to progressing from the ‘evaluation/trial’ stage to the ‘adoption/advanced implementation’ stage of ‘open content’, higher adoption levels regarding digitization (odds ratio 2.270) and social media use (odds ratio 1.370), as measured on a scale from 0 to 5, turned out to be the only predictors. It should

be noted though that the attitudes regarding the publication of content to be freely re-used by third parties weren't included in the model as this would have weakened its explanatory power. Previous analyses have however shown an association between such attitudes and the adoption of 'open content'.

### **Factors favoring the adoption of collaborative content creation**

The inception of the adoption process regarding 'collaborative content creation' appeared to be:

- positively related to higher adoption levels regarding social media use (odds ratio: 1.701);
- more likely among pure volunteer organizations than among organizations with paid staff (with an odds ratio of 0.128 for institutions with a mix of paid staff and volunteers and an odds ratio of 0.133 for institutions without volunteers).

The eventual adoption of 'collaborative content creation' was in turn found to be:

- positively related to a 'sufficient' overall skills level (odds ratio 6.474);
- less likely in the case of libraries compared to other institution types (with odds ratios of 46.888 for archives, 50.963 for mixed types, and 63.441 for museums);
- more likely in the case of institutions with a mix of paid staff and volunteers than in the case of pure volunteer organizations (odds ratio: 16.534).

The values reported for 'collaborative content creation' are based on a dataset that has been corrected for self-selection bias based on propensity score matching (see Estermann *forthcoming* for further explanations).

### **Factors favoring the adoption of linked data**

The inception of the adoption process with regard to 'linked data' was found to be:

- positively related to a higher number of metadata types (odds ratio: 2.526); and
- positively related to a higher adoption level regarding open data (odds ratio: 1.261).

In addition, weak associations were found with a higher E-Participation Index (std. deviation: 0.216; odds ratio: 6.260) and the absence of research institutions/specialists among the main users of an institution (odds ratio 1.973). Also, institutions without volunteers were found to be less likely to take the initial steps towards adoption than institutions run exclusively by volunteers (odds ratio: 3.664).

And, finally, the adoption of ‘linked data’ appeared to be:

- positively related to higher adoption levels regarding open data (odds ratio: 1.804) and social media use (odds ratio: 1.939);
- positively related to the absence of three-dimensional man-made movable objects among the heritage objects that are characteristic for the institution (odds ratio: 6.492); and
- surprisingly more likely among small institutions with annual revenues of up to 100’000 € than among large institutions with annual revenues of more than 1 mio. €. (odds ratio: 9.917).

## **Changes in perception regarding the importance and desirability of various practices**

‘Importance’ ratings of the Internet-related practices under consideration roughly correspond to the effective advancement of the adoption of the various practices among heritage institutions, with ‘digitization’ and ‘engaging audiences on the internet’ ranking highest (with average scores of 4.13 and 3.55 on a scale from 1 to 5), followed by ‘open data’ (3.21), ‘open content’ (3.09), ‘linked data / semantic web’ (2.84) and ‘collaborative content creation’ (2.79). Interestingly, however, ‘open data’ and ‘open content’ rank lowest on desirability (opportunities vs. risks) with average values of 3.15 and 3.19, respectively. Thus, as far as the general assessment of risks and opportunities are concerned, they rank behind other practices, such as ‘linked data’ (3.59) or ‘collaborative content creation’ (3.49) that are less widespread among heritage institutions. As one would expect given the general progress regarding their adoption, ‘digitization’ and ‘social media use’ rank highest with regard to perceived desirability (average scores of 4.37 and 3.97).

When looking at the shifts in importance and desirability ratings as institutions adopt one or the other practice, the following can be observed:

Higher adoption levels of ‘**digitization**’ are associated with higher importance ratings of digitization and open data. The perception of the importance of the other practices is rather constant across the various adoption levels of ‘digitization’. The same is true for the perceived desirability of the various practices (at the exception of ‘digitization’ the desirability of which is assessed higher among institutions that are more advanced regarding digitization).

Higher adoption levels of **social media use** are associated with higher importance ratings of all Internet-related practices (see figure 4). There is a similar, but somewhat less pronounced tendency with regard to the perceived desirability of the various Internet-related practices, at the exception of ‘digitization’.

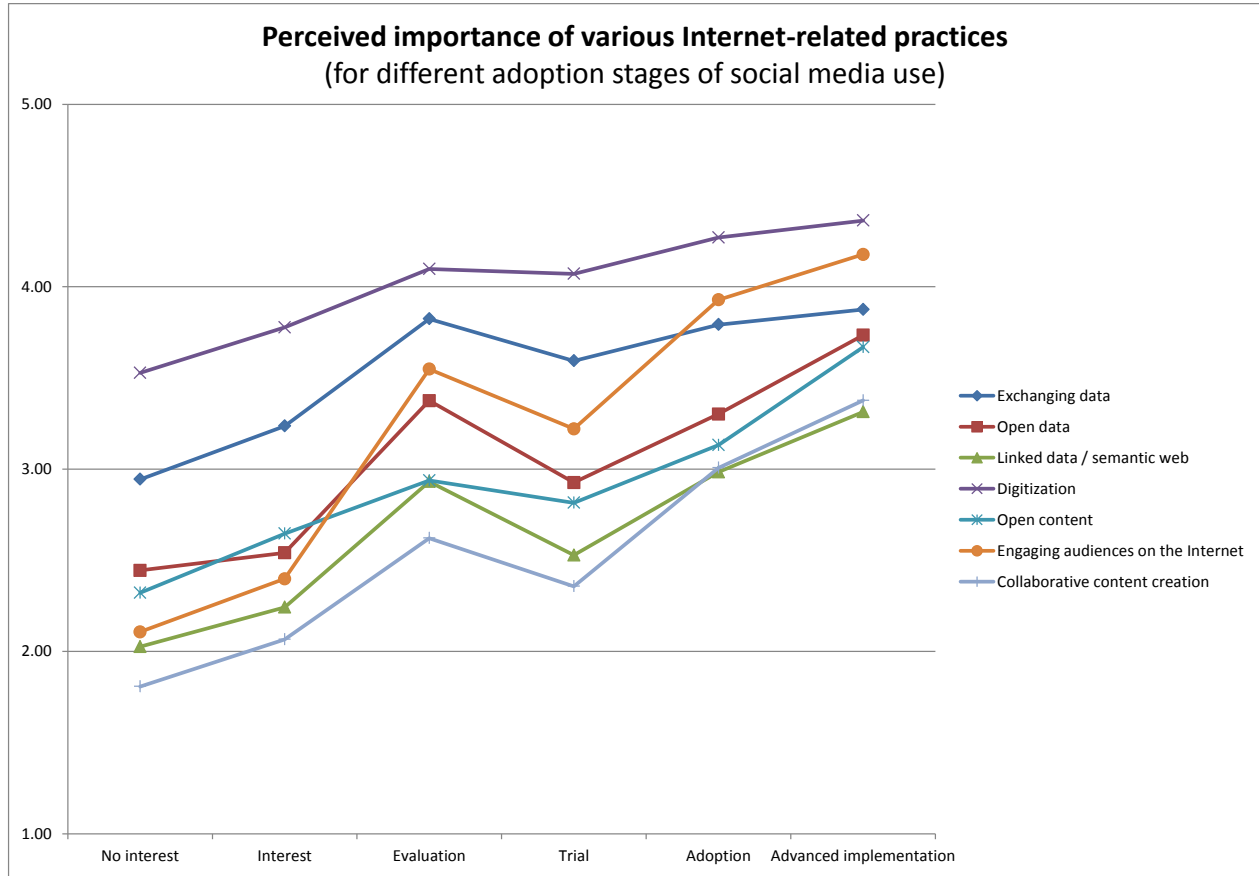


Figure 4: Perceived importance of various Internet-related practices for different adoption stages of social media use

Higher adoption levels of **‘open data’** are associated with higher importance ratings of all Internet-related practices at the exception of ‘engaging audiences on the Internet’ and ‘collaborative content creation’. Institutions that are more advanced regarding the adoption of ‘open data’ are also more likely to positively rate the desirability of ‘exchanging data with other institutions’, ‘open data’, ‘open content’ and ‘linked data / semantic web’ than their counterparts.

Institutions that are more advanced regarding the adoption of **‘open content’** and **‘collaborative content creation’** tend to show higher ‘importance’ ratings for all the Internet-related practices than their counterparts. They also tend to show a more positive evaluation of the desirability of these practices than the other institutions, at the exception of ‘digitization’ and ‘exchanging data with other institutions’ for which the values are constant.

Similarly, institutions that are more advanced regarding the adoption of **‘linked data’** tend to show higher ‘importance’ ratings for all the Internet-related practices. Regarding the evaluation of the desirability, the ratings are relatively constant across all adoption stages of linked data, at the exception of ‘open content’ and ‘collaborative content creation’ where a positive effect can be observed. This means that ‘linked data’ is the only one among the six practices under examination whose adoption level is not positively correlated with its perceived desirability.

### **Attitudes regarding ‘open content’**

As has been noted earlier (Estermann 2015), heritage institutions are rather hesitant when asked about their readiness to apply the ‘open data’ principles to their holdings: only 21% would allow their content to be used by ‘commercial users’, and for 73% it is important that the content be used only without modification.

Interestingly, institutions that have adopted social media use are more likely to be ready to make their content freely available on the Internet for re-use by commercial users or non-profit projects that permit commercial use (culminating in an average value of 3.2 among those most advanced regarding the adoption of social media use). Similarly, institutions at the ‘advanced implementation’ stage of social media use are the most inclined to let users modify their content. Thus, the adoption of social media use seems to be associated with an increased openness of the institution with regard to ‘open content’, even though important reservations remain among many institutions.

In contrast, institutions that are more advanced regarding the digitization of their holdings are at least as reserved at the prospect of opening up their content as their counterparts who haven’t digitized their holdings.

The most striking finding however concerns the relationship between the adoption of ‘open content’ and the institution’s attitudes regarding the opening up of content. One would indeed expect a sharp change in attitudes as institutions transit from the ‘interest’ stage to the ‘adoption’ and the ‘advanced implementation’ stage regarding the adoption of ‘open content’. This is however not the case: There is only a relatively small increase from an average value of 1.9 to 2.6 (on a scale ranging from 1 to 5) as far as the readiness is concerned to make content available for commercial use, while the restriction that works shall only be used without modification is as widespread among adopters of ‘open content’ as it is among their counterparts, with values ranging between 3.9 and 4.3. There seems to be a certain disconnect between Internet-related practices and attitudes regarding the opening up of content, which even applies to institutions which report that substantial parts of their collections have already been made available as ‘open content’.

### **Shifts in focus regarding the benefits, risks and opportunities of social media use, open content, and collaborative content creation**

As institutions move from the ‘evaluation’ or ‘trial’ stage through the ‘adoption’ stage to the ‘advanced implementation’ stage, they tend to evaluate the purposes or benefits of the practices slightly more



positively. For the use of social media, these positive shifts in perception are most pronounced for the following items:

- to give users/citizens a say with regard to important decisions of the institution (+ 0.55 points on a scale from 1 to 5);
- to promote networking and community building among the target audiences (+ 0.50);
- to enhance transparency and accountability (+ 0.48);
- to gather ideas from users (+ 0.47);
- to promote offline activities (+ 0.45);
- to improve interactions with users (+ 0.40).

This shifts however hardly affect the ranking of the different items (see figure 5), the three main purposes being ‘improving the visibility and perceived relevance of the institution’, ‘attracting new users’, and ‘improving interactions with users’, followed by ‘promoting networking and community building among the target audiences’ and ‘improving the discoverability of the institution’s holdings’.

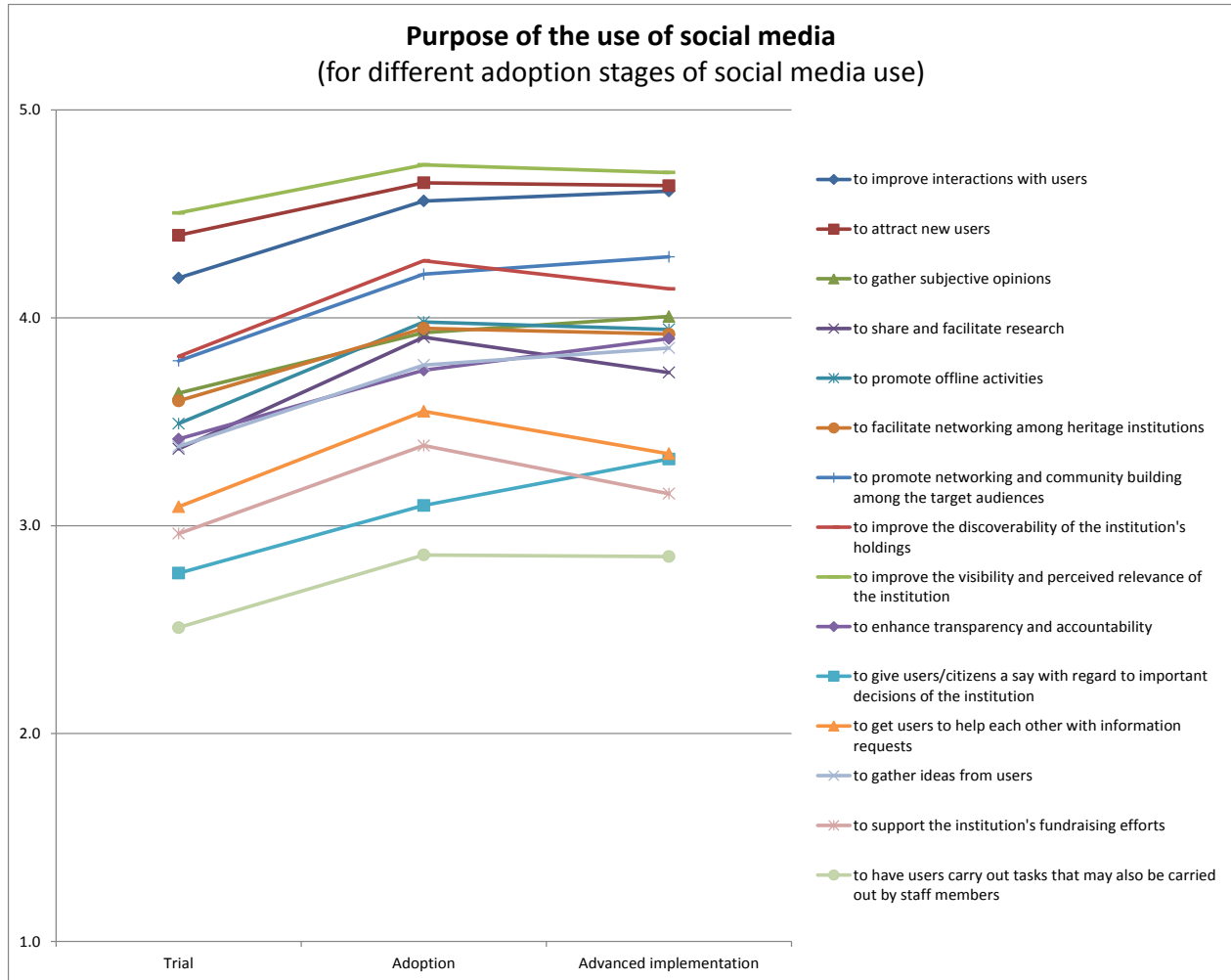


Figure 5: Purpose of the use of social media for different adoption stages of social media use

In the case of ‘open content’, the shifts between the ‘evaluation’ stage and the ‘advanced implementation’ stage were all positive as well, but none of them particularly pronounced, with all the values below the 0.40 mark. As can be seen in figure 6, there is a series of perceived benefits that rank rather high: ‘improving the visibility or perceived relevance of the institution’, ‘improving the discoverability of the institution’s holdings’, ‘making content more easily available to existing users’, ‘attracting new users’, ‘improving interactions with users’, and ‘facilitating networking among heritage institutions’. This is reflected by the widespread conviction among the institutions which have passed the ‘interest’ stage that ‘open content’ greatly helps them to better fulfill their core mission (with average scores ranging from 4.27 to 4.59).

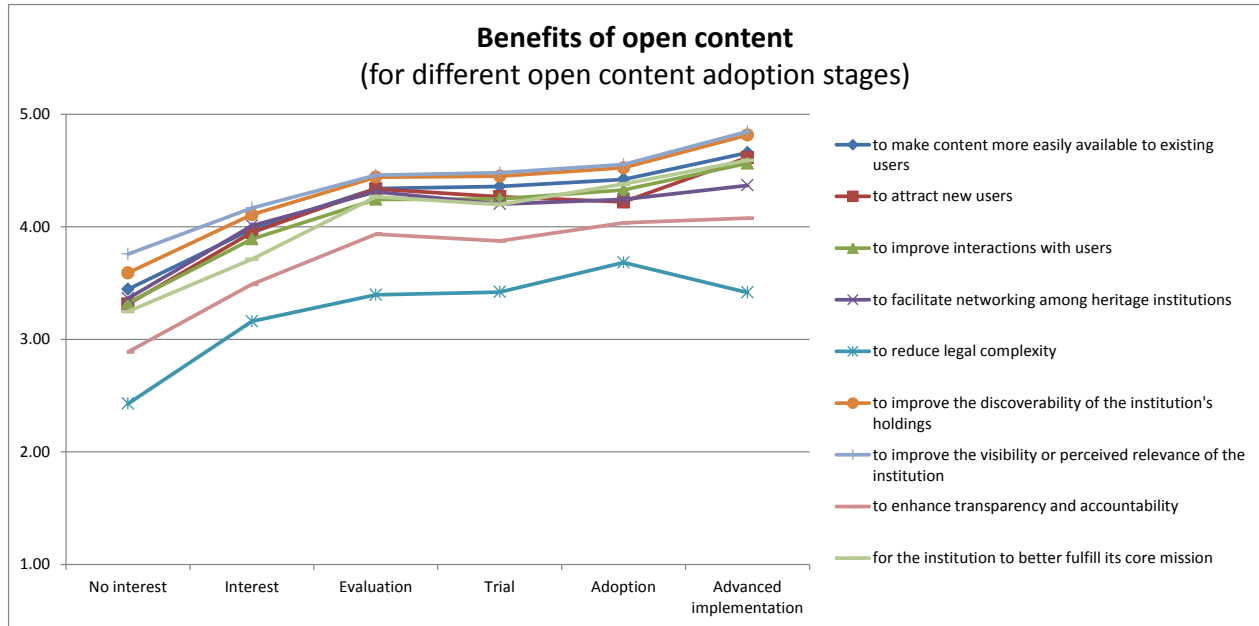


Figure 6: Perceived benefits of open content for different adoption stages

In the case of ‘collaborative content creation’, the most pronounced shifts concerned the following items:

- to have certain tasks carried out in spite of resource constraints (+ 0.70);
- to gain access to external expertise (+ 0.47);
- to increase trust and loyalty of the users/visitors with regard to our institution (+ 0.43).

However, as can be seen in figure 7, all the items have very similar scores and follow the same pattern across the different adoption stages.

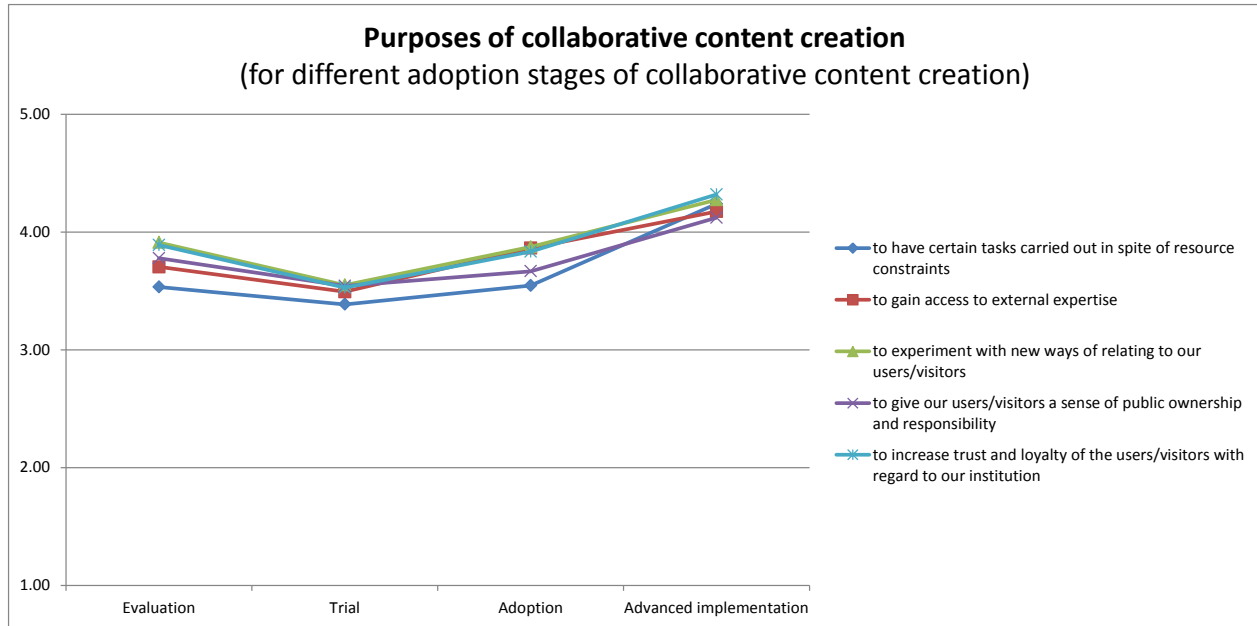


Figure 7: Purposes of open content for different adoption stages

In the case of ‘open content’ and ‘collaborative content creation’, the respondents were also asked about the downsides. Regarding ‘open content’, positive and negative shifts of perceptions could be observed, depending on the item. The most pronounced positive shifts concern the following items with regard to challenges of ‘open content’:

- ‘unknown copyright holders (orphan works)’ (- 0.44); and
- ‘time effort and expense related to proper documentation of the content’ (- 0.43).

These challenges appear to diminish most as the institutions progress with regard to the implementation of ‘open content’. As to the risks, there is one item for which there is a pronounced negative shift: ‘desecration of places, rites, objects’ (+ 0.41). This item is however still not among the most important ones, but it seems to be of more concern for institutions which are already making significant parts of their collections available as ‘open content’.

In the case of ‘collaborative content creation’, only positive shifts were observed. They were most pronounced for the items:

- limited planning security (- 0.43);
- difficulties to estimate the time scope (- 0.41); and
- anxiety among employees (loss of job, changes to roles and tasks, etc.) (- 0.40).

When looking at the ranking of the items for the different analyses, their order stays more or less the same across the different adoption stages, which suggests that there are no particularly game-changing dynamics at work when it comes to shifts in perception regarding benefits, risks and opportunities of the practices under examination.

## **DISCUSSION**

Based on the results, we can tackle the research questions:

### **Links and mutual influences between various Internet-related practices**

Regarding the links and mutual influences between various Internet-related practices, several instances could be identified where certain practices tend to be preceded by other practices in a given institution, suggesting several typical paths followed by heritage institutions when it comes to adopting the practices under examination.

A detailed analysis for individual steps of the innovation adoption process yielded the following results:

- Unlike suggested by a first ordinal regression analysis (cf. figure 3), no significant link was found between digitization and open data.
- Unsurprisingly, digitization appeared to be a pre-requisite of ‘open content’ (at the inception of the adoption process and even more so for the progression to the adoption stage).
- Similarly, ‘open data’ appears to be a prerequisite of ‘linked data’ (rather clearly at the inception of the adoption process and a bit less pronounced for the progression to the adoption stage). This suggests that ‘linked data’ is mostly approached as ‘linked open data’, which facilitates the inter-connection of collections across institutional boundaries.

- Interestingly, social media use was found to be a prerequisite not only for ‘collaborative content creation’ (at the inception of the adoption process), but also with regard to ‘open content’ (both at the inception of the adoption process and for the progression to the adoption stage) and with regard to ‘linked data’ (for the progression to the adoption stage, on which its influence is rather strong). This central role of the adoption of social media use with regard to the adoption of other Internet-related practices relevant in the context of OpenGLAM is also illustrated by the fact that higher adoption levels of social media use are associated with a pronounced increase of perceived importance and desirability of other Internet-related practices, an observation that hasn’t been made regarding ‘digitization’.

Furthermore, it appears from the analyses that the number of metadata types present in an institution is a major factor regarding the adoption of various practices. This is the case for the inception of the adoption processes regarding ‘digitization’, ‘open data’, ‘open content’, and ‘linked data’. It is also the case for the adoption of ‘digitization’, although at later stages of the innovation adoption process, the direction of the relationship cannot be established for sure based on the cross-sectional data at hand. After all, we are merely identifying correlations, which means that it may well be that digitization activities trigger the creation of metadata. In this context it is also interesting to note that 36% of institutions indicated that they don’t have metadata in form of ‘catalogues, inventories, finding aids’, ‘glossaries, vocabularies, ontologies’, or ‘name authority files’. The absence of centrally managed metadata may thus be an important inhibitor regarding the adoption of many practices relevant in the context of OpenGLAM.

While the adoption levels for the various practices are all correlated with each other (with Pearson correlation coefficients ranging from 0.19 to 0.49), several typical, inter-connected paths could be identified that are followed by heritage institutions when adopting the Internet-related practices under examination:

A first path starts with the adoption of social media use. Its inception is more likely among institutions in countries with a higher E-Participation-Index. Furthermore, purely volunteer-based institutions are less

likely to think about adopting social media use than institutions with paid staff. Whether the institutions eventually adopt social media use mainly depends on their geographical reach, their size in terms of number of paid staff, the number of ways used to acquire skills and know-how, and appears to be more likely if archival resources don't count among the heritage objects that are characteristic for the institution. The adoption of social media use in turn is an important factor regarding the adoption of 'collaborative content creation' and 'open content' (in both cases throughout the entire adoption process), as well as for the adoption of 'linked data'.

A second path starts with the adoption of digitization, a process which is most likely to be initialized by institutions with a higher number of metadata types and which count public authorities among their main users. The actual adoption of 'digitization' is positively influenced by a higher number of methods used for skills acquisition, a higher number of metadata types, and a higher E-Participation Index. It is more likely among museums than among libraries, more likely among institutions without natural resources, more likely among institutions with digital interactive resources, and more likely among institutions which count educational institutions among their main users. The fact that institutions reporting annual revenues above one million euro were found to be less likely to adopt 'digitization' than institutions with annual revenues between 500'000 and 1 million euro may be due to an artefact related to the operationalization of the adoption stage in our model, where institutions with larger holdings may be penalized as the 'adoption' stage for 'digitization' and 'open content' is assumed to have been reached when a given percentage of the institution's holdings have already been digitized. Thus, larger institutions may already well be into 'digitization' while it is still a far way to go until they have digitized 5% or 10% of their holdings. The adoption of 'digitization' itself is an important prerequisite with regard to the adoption of 'open content'.

The results of the ordinal regression analysis suggest the adoption of 'open data' is preceded by the adoption of 'digitization'. This is however not supported by the results obtained by means of the multinomial regression analysis. A third path may therefore start from 'open data' and have its continuation with the adoption of 'linked data'. The most important prerequisite for the inception of the

process leading to the adoption of ‘open data’ is the presence of centrally managed metadata in the institution. Also, the process is more likely to be initiated by institutions which rely on a higher number of volunteers. As to the actual adoption of ‘open data’, it is more likely among institutions in countries with a higher E-Participation Index and with a generally ‘sufficient’ skills level among their staff. Furthermore, the data suggest that the adoption of ‘open data’ is more likely among libraries than among other institution types.

### **Intensity of E-Participation as an influential context factor at the country level**

The second research question pertains to the relevant context factors at the country level. Here, the following observations were made:

Higher scores on the E-Participation Index are positively related to the adoption of ‘digitization’ and ‘open data’ as well as to the inception of the adoption processes of ‘social media use’ and ‘linked data’. Given the inter-dependencies between the adoption processes of the various practices, the aspects captured by the E-Participation Index thus play a central role with regard to the adoption of all Internet-related practices under examination. The e-participation index (EPI) is calculated as part of the UN E-Government Survey (UN 2014) and focuses on the use of online services to facilitate provision of information by governments to citizens (‘e-information sharing’), interaction with stakeholders (‘e-consultation’) and engagement in decision-making processes (‘e-decision making’). Based on a qualitative assessment of the availability and relevancy of participatory services available on government websites, it is reflective of the online participation culture within a given country.

Surprisingly, GDP, which is strongly correlated with the ICT Development Index (covering the dimensions ICT access, ICT use, and ICT skills) and the Human Development Index (taking into account life expectancy, years of schooling, and gross national income per capita), has no positive influence on the adoption of the various Internet-related practices. In the ordinal logistic regression model, GDP was even found to be negatively correlated with the adoption of social media use. And strangely enough, GDP was found to be negatively correlated with the effective use of four basic methods of skills acquisition by a country’s heritage institutions.



The third country-level variable introduced into the regression models relates to the effective use of different methods of skills acquisition among a country's heritage institutions. Here again, no positive influence was found on the adoption of the various Internet-related practices. The skills-related factors influencing the adoption of some of the practices therefore don't seem to be related to the level of effective information and/or educational offers in a given country. They rather seem to be linked to the skills-acquisition strategy employed by a given institution.

### **Observed changes in attitudes**

The third research question focused on changes in attitudes related to the adoption of the various practices. First of all, it should be noted that all Internet-related practices appear to be self-reinforcing: institutions that have reached higher adoption levels tend to perceive the practices as more important and also as more desirable for them (at the exception of linked data). This is in line with the fact that only a very small number of institutions indicated that they would abandon a given practice. And it is also in line with the generally positive or neutral development of attitudes regarding the benefits, risks and opportunities of social media use, open content, and collaborative content creation, as institutions pass through the different adoption stages. Everything therefore seems to indicate that the Internet-related practices under examination are here to stay.

Although various differences in attitudes could be observed depending on the adoption stage at which a given institution finds itself, there are no dramatic effects that would change the dynamics of the adoption processes. In fact, the rankings of individual items remain mostly unaffected by the changes in attitudes observed across different adoption stages.

In the case of attitudes regarding 'open content' it has become apparent that changes in attitudes are slow. When comparing the conditions under which an institution says that it would make its content freely available on the Internet for re-use by third parties with its declared practice regarding the opening up of collections, it appears that the practice and the attitudes regarding 'open content' are rather disconnected from each other. There are at least two possible explanations for this: First, it may well be that certain

attitudes remain relatively unchanged, even when the practice changes. In this case, it would be interesting to observe the changes in attitudes over a longer time-span in order to verify whether an adjustment eventually happens or whether these contradictions persist over time. Second, it cannot be fully excluded that some institutions may have wrongly declared their practice with regard to ‘open content’ – although, we don’t have any further indications so far that this may actually be the case.

When looking at the institutions’ motivations for social media use and the adoption of ‘open content’ it appears that the goal of improving an institution’s visibility and perceived relevance ranks highest, followed by the wish to improve interactions with users and the goal of promoting networking and community building among target audiences and heritage institutions. With regard to ‘collaborative content creation’, there is a double focus of getting tasks done and gaining access to external expertise, on the one hand, and of improving the relationship with users and giving them a sense of public ownership and responsibility on the other. Thus, the institutions appear to be heading for a win-win situation, based on more ‘openness’ towards and participation by users.

## CONCLUSIONS AND OUTLOOK

In the present paper we have given an account of how heritage institutions appropriate the notion of openness. We have shown that they approach the idea of ‘open data’ and ‘open content’ with some serious reservations. But, looking at the heritage sector as whole, this mindset doesn’t keep the institutions from opening up their collections in practice, and there is evidence for positive dynamics with regard to all OpenGLAM-related practices under examination. While reservations persist when it comes to releasing content for commercial use or letting third parties modify it, the data suggests that OpenGLAM will eventually benefit both the heritage institutions and their users and fit in well with the institutions’ core mission.

A number of factors have been identified which favor or hinder the adoption of OpenGLAM-related practices. Some of them concern particularities of the institutions that may easily be subject to change, such as the existence of centrally managed metadata, an institution’s strategy of acquiring skills and know-how, or the size of its volunteer program. Other characteristics of an institution that play a role are immutable or more difficult to change, such as the institution type, the types of heritage objects, the types of main users, the institution’s size and geographical reach as well as its ability to hire paid staff. And finally, the online participation culture of the country where the heritage institution is located also plays an influential role with regard to the adoption of all of the OpenGLAM-related practices under consideration. Interestingly, the adoption of these practices appears to be unrelated to the economic situation or the quality of the IT-infrastructure of a given country. As a consequence, it would be interesting to investigate how and to what extent institutions in economically weaker countries manage to outdo their counterparts in well-off countries on certain aspects of OpenGLAM.

Interesting as these findings are, the quantitative approach used in the context of our study only captures structural aspects, while the aspect of agency that plays a role when it comes to taking decisions about opening up collections or engaging in a participatory or collaborative approach remains a black box. In order to complement our findings it would therefore be worthwhile to pursue a qualitative approach by asking what choices decision-makers concretely take in their given context, what strategies they pursue,

what their beliefs and expectations are, and what the constraining factors are with regard to their aims. A qualitative approach would also allow to shed more light on the transformation processes that take place within heritage institutions as they move towards more ‘openness’ and participation and could attempt to describe the concrete benefits and drawbacks that come with this transformation.

Additional quantitative research, on the other hand, may investigate the relevance of further context factors, such as public policy, lobbying activities, outreach activities, or awareness campaigns carried out by organizations promoting open data and free knowledge. So far, these factors haven’t been taken into account in the regression models due to a lack of relevant indicators.

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The survey data, along with the questionnaire, are available on: <http://survey.openglam.ch>

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**ANNEX – OVERVIEW TABLES FOR THE MULTINOMIAL REGRESSION ANALYSES**

Parameter Estimates									
		B	Std. Error	Wald	df	Sig.	Exp(B)	for Exp(B)	
								Lower Bound	Upper Bound
adoption level of digitization <sup>a</sup>									
Evaluation /	Intercept	12.169	5.201	5.474	1	.019			
Trial	reach	-.067	.272	.061	1	.805	.935	.548	1.594
	paid_fte	.008	.010	.695	1	.404	1.008	.989	1.027
	vol_fte	-.008	.013	.378	1	.539	.992	.967	1.017
	revenue_src1	-.024	.014	2.832	1	.092	.977	.950	1.004
	revenue_src2	-.024	.015	2.563	1	.109	.976	.948	1.005
	revenue_commercial	-.013	.016	.681	1	.409	.987	.956	1.018
	revenue_src8	-.028	.017	2.738	1	.098	.972	.941	1.005
	used_skills_acquisition_num_cat3	.308	.261	1.389	1	.239	1.360	.815	2.270
	metadata_num	.508	.250	4.138	1	.042	1.662	1.019	2.712
	EP12014	-0.133	1.346	.973	1	.324	.876	.673	1.140
	GDP2012	-.056	.106	.273	1	.601	.946	.768	1.165
	GLAMeffuse_4methods	-2.274	1.477	2.371	1	.124	.103	.006	1.861
	[inststpe_selfZ_3=1.00]	.774	.932	.689	1	.406	2.168	.349	13.468
	[inststpe_selfZ_3=2.00]	.314	.974	.104	1	.747	1.369	.203	9.227
	[inststpe_selfZ_3=4.00]	1.515	1.192	1.614	1	.204	4.549	.440	47.086
	[inststpe_selfZ_3=93.00]	0 <sup>b</sup>			0				
	[obj1=0]	.292	.614	.226	1	.635	1.339	.402	4.464
	[obj1=1]	0 <sup>b</sup>			0				
	[obj2=0]	-.952	.520	3.346	1	.067	.386	.139	1.070
	[obj2=1]	0 <sup>b</sup>			0				
	[obj3=0]	.203	.507	.160	1	.689	1.225	.454	3.308
	[obj3=1]	0 <sup>b</sup>			0				
	[obj4=0]	-.103	.689	.022	1	.882	.902	.234	3.485
	[obj4=1]	0 <sup>b</sup>			0				
	[obj5=0]	-.695	.694	1.005	1	.316	.499	.128	1.943
	[obj5=1]	0 <sup>b</sup>			0				
	[obj6=0]	.654	.574	1.302	1	.254	1.924	.625	5.923
	[obj6=1]	0 <sup>b</sup>			0				
	[obj7=0]	-.163	.513	.101	1	.751	.850	.311	2.323
	[obj7=1]	0 <sup>b</sup>			0				
	[obj8=0]	-.133	.627	.045	1	.832	.875	.256	2.994
	[obj8=1]	0 <sup>b</sup>			0				
	[usr2=0]	.237	.595	.159	1	.691	1.267	.395	4.070
	[usr2=1]	0 <sup>b</sup>			0				
	[usr3=0]	-1.721	.751	5.250	1	.022	.179	.041	.780
	[usr3=1]	0 <sup>b</sup>			0				
	[usr4=0]	.310	.523	.352	1	.553	1.363	.489	3.798
	[usr4=1]	0 <sup>b</sup>			0				
	[usr5=0]	.907	.706	1.654	1	.198	2.478	.622	9.877
	[usr5=1]	0 <sup>b</sup>			0				
	[usr6=0]	-.140	.490	.081	1	.775	.870	.333	2.270
	[usr6=1]	0 <sup>b</sup>			0				
	[usr7=0]	.249	.541	.212	1	.646	1.283	.444	3.707
	[usr7=1]	0 <sup>b</sup>			0				
	[revenues_EUR_cat4=1.00]	-.216	.897	.058	1	.810	.806	.139	4.673
	[revenues_EUR_cat4=2.00]	-.793	.810	.958	1	.328	.452	.092	2.215
	[revenues_EUR_cat4=3.00]	-1.304	.921	2.007	1	.157	.271	.045	1.649
	[revenues_EUR_cat4=4.00]	0 <sup>b</sup>			0				
	[pct_vol_fte_cat3=1]	-.201	.860	.054	1	.816	.818	.152	4.417
	[pct_vol_fte_cat3=2]	.083	.806	.011	1	.918	1.086	.224	5.272
	[pct_vol_fte_cat3=3]	0 <sup>b</sup>			0				
	[org_form=1]	.076	.895	.007	1	.933	1.079	.187	6.232
	[org_form=2]	-1.020	.934	1.192	1	.275	.361	.058	2.251
	[org_form=4]	0 <sup>b</sup>			0				

a. The reference category is: No interest / Interest.

b. This parameter is set to zero because it is redundant.

Parameter Estimates									
		B	Std. Error	Wald	df	Sig.	Exp(B)	for Exp(B)	
								Lower Bound	Upper Bound
adoption level of digitization <sup>a</sup>									
Adoption / Advanced implementa tion	Intercept	-1.326	2.613	.258	1	.612			
	reach	.111	.144	.593	1	.441	1.117	.842	1.482
	paid_fte	.002	.002	.833	1	.361	1.002	.998	1.005
	vol_fte	.001	.006	.017	1	.895	1.001	.988	1.013
	revenue_src1	.002	.006	.084	1	.772	1.002	.991	1.013
	revenue_src2	.006	.008	.742	1	.389	1.006	.992	1.021
	revenue_commercial	.006	.007	.558	1	.455	1.006	.991	1.020
	revenue_src8	.000	.009	.001	1	.978	1.000	.983	1.018
	used_skills_acquisition_num_cat3	.297	.143	4.335	1	.037	1.346	1.018	1.780
	metadata_num	.315	.119	6.967	1	.008	1.370	1.085	1.732
	EPI2014	0.284	.715	15.786	1	.000	1.328	1.155	1.528
	GDP2012	.055	.055	1.018	1	.313	1.057	.949	1.176
	GLAMeffuse_4methods	-1.034	.784	1.741	1	.187	.355	.076	1.652
	[insttype_selfZ_3=1.00]	.665	.510	1.698	1	.193	1.944	.715	5.282
	[insttype_selfZ_3=2.00]	1.737	.556	9.742	1	.002	5.678	1.908	16.898
	[insttype_selfZ_3=4.00]	1.504	.560	7.226	1	.007	4.501	1.503	13.478
	[insttype_selfZ_3=93.00]	0 <sup>b</sup>			0				
	[obj1=0]	.350	.332	1.112	1	.292	1.420	.740	2.723
	[obj1=1]	0 <sup>b</sup>			0				
	[obj2=0]	-.262	.317	.684	1	.408	.769	.414	1.432
	[obj2=1]	0 <sup>b</sup>			0				
	[obj3=0]	.403	.276	2.127	1	.145	1.496	.871	2.569
	[obj3=1]	0 <sup>b</sup>			0				
	[obj4=0]	.076	.369	.042	1	.837	1.079	.524	2.221
	[obj4=1]	0 <sup>b</sup>			0				
	[obj5=0]	.761	.369	4.259	1	.039	2.140	1.039	4.408
	[obj5=1]	0 <sup>b</sup>			0				
	[obj6=0]	-.047	.311	.023	1	.881	.954	.518	1.757
	[obj6=1]	0 <sup>b</sup>			0				
	[obj7=0]	.004	.271	.000	1	.989	1.004	.590	1.707
	[obj7=1]	0 <sup>b</sup>			0				
	[obj8=0]	-.881	.302	8.485	1	.004	.414	.229	.750
	[obj8=1]	0 <sup>b</sup>			0				
	[usr2=0]	-.708	.348	4.136	1	.042	.493	.249	.975
	[usr2=1]	0 <sup>b</sup>			0				
	[usr3=0]	.358	.332	1.163	1	.281	1.430	.746	2.741
	[usr3=1]	0 <sup>b</sup>			0				
	[usr4=0]	-.012	.300	.002	1	.968	.988	.548	1.780
	[usr4=1]	0 <sup>b</sup>			0				
	[usr5=0]	-.360	.362	.993	1	.319	.697	.343	1.417
[usr5=1]	0 <sup>b</sup>			0					
[usr6=0]	.059	.282	.044	1	.834	1.061	.611	1.842	
[usr6=1]	0 <sup>b</sup>			0					
[usr7=0]	-.011	.294	.002	1	.969	.989	.555	1.760	
[usr7=1]	0 <sup>b</sup>			0					
[revenues_EUR_cat4=1.00]	.704	.410	2.951	1	.086	2.021	.906	4.512	
[revenues_EUR_cat4=2.00]	.653	.397	2.703	1	.100	1.920	.882	4.181	
[revenues_EUR_cat4=3.00]	1.019	.503	4.103	1	.043	2.769	1.033	7.419	
[revenues_EUR_cat4=4.00]	0 <sup>b</sup>			0					
[pct_vol_fte_cat3=1]	.437	.471	.863	1	.353	1.548	.616	3.895	
[pct_vol_fte_cat3=2]	.245	.430	.325	1	.569	1.278	.550	2.970	
[pct_vol_fte_cat3=3]	0 <sup>b</sup>			0					
[org_form=1]	-.461	.431	1.139	1	.286	.631	.271	1.470	
[org_form=2]	-.174	.464	.141	1	.707	.840	.338	2.086	
[org_form=4]	0 <sup>b</sup>			0					

a. The reference category is: Evaluation / Trial.

b. This parameter is set to zero because it is redundant.

Parameter Estimates									
adoption level of social media <sup>a</sup>		B	Std. Error	Wald	df	Sig.	Exp(B)	for Exp(B)	
								Lower Bound	Upper Bound
Evaluation / Trial	Intercept	-4.894	5.707	.735	1	.391			
	reach	-.088	.279	.100	1	.752	.916	.530	1.583
	paid_fte	.035	.030	1.379	1	.240	1.035	.977	1.098
	vol_fte	.011	.028	.160	1	.689	1.011	.957	1.068
	revenue_src1	.006	.011	.262	1	.609	1.006	.984	1.028
	revenue_src2	.001	.014	.005	1	.942	1.001	.975	1.028
	revenue_commercial	-.003	.014	.052	1	.820	.997	.970	1.024
	revenue_src8	.004	.018	.061	1	.806	1.004	.969	1.041
	used_skills_acquisition_num_cat	-.247	.277	.793	1	.373	.781	.454	1.345
	overall_skills_level_cat2	.611	.472	1.673	1	.196	1.841	.730	4.645
	skills_acquisition_overall	.017	.264	.004	1	.948	1.017	.607	1.706
	metadata_num	.279	.213	1.722	1	.189	1.322	.871	2.006
	EPI2014	0.329	1.449	5.149	1	.023	1.389	1.046	1.845
	GDP2012	-.094	.122	.596	1	.440	.910	.717	1.156
	GLAMeffuse_4methods	.127	1.700	.006	1	.941	1.135	.041	31.794
	[insttype_self=1]	-.065	.848	.006	1	.939	.937	.178	4.936
	[insttype_self=2]	-.017	.680	.001	1	.980	.983	.259	3.730
	[insttype_self=3]	-.135	1.061	.016	1	.899	.874	.109	6.984
	[insttype_self=4]	0 <sup>b</sup>			0				
	[obj1=0]	.077	.593	.017	1	.897	1.080	.338	3.453
	[obj1=1]	0 <sup>b</sup>			0				
	[obj2=0]	.316	.568	.309	1	.579	1.371	.450	4.179
	[obj2=1]	0 <sup>b</sup>			0				
	[obj3=0]	.000	.520	.000	1	1.000	1.000	.361	2.768
	[obj3=1]	0 <sup>b</sup>			0				
	[obj4=0]	-.927	.654	2.012	1	.156	.396	.110	1.425
	[obj4=1]	0 <sup>b</sup>			0				
	[obj5=0]	-1.358	.821	2.733	1	.098	.257	.051	1.286
	[obj5=1]	0 <sup>b</sup>			0				
	[obj6=0]	-.259	.546	.225	1	.635	.772	.265	2.251
	[obj6=1]	0 <sup>b</sup>			0				
	[obj7=0]	.399	.520	.588	1	.443	1.490	.538	4.130
	[obj7=1]	0 <sup>b</sup>			0				
	[obj8=0]	.318	.592	.289	1	.591	1.375	.431	4.388
	[obj8=1]	0 <sup>b</sup>			0				
	[usr1=0]	-.887	1.102	.648	1	.421	.412	.048	3.569
	[usr1=1]	0 <sup>b</sup>			0				
	[usr2=0]	-.502	.569	.779	1	.377	.605	.198	1.846
	[usr2=1]	0 <sup>b</sup>			0				
	[usr3=0]	.936	.628	2.224	1	.136	2.550	.745	8.728
[usr3=1]	0 <sup>b</sup>			0					
[usr4=0]	-.084	.552	.023	1	.880	.920	.312	2.716	
[usr4=1]	0 <sup>b</sup>			0					
[usr5=0]	.509	.820	.385	1	.535	1.663	.334	8.290	
[usr5=1]	0 <sup>b</sup>			0					
[usr6=0]	.182	.508	.128	1	.720	1.200	.443	3.247	
[usr6=1]	0 <sup>b</sup>			0					
[usr7=0]	.019	.525	.001	1	.971	1.019	.364	2.853	
[usr7=1]	0 <sup>b</sup>			0					
[revenues_EUR_cat4=1.00]	-.103	.996	.011	1	.918	.902	.128	6.355	
[revenues_EUR_cat4=2.00]	.635	1.023	.386	1	.534	1.888	.254	14.014	
[revenues_EUR_cat4=3.00]	-.684	1.097	.389	1	.533	.505	.059	4.335	
[revenues_EUR_cat4=4.00]	0 <sup>b</sup>			0					
[pct_vol_fte_cat3=1]	1.744	.842	4.294	1	.038	5.723	1.099	29.800	
[pct_vol_fte_cat3=2]	2.279	.742	9.431	1	.002	9.769	2.281	41.839	
[pct_vol_fte_cat3=3]	0 <sup>b</sup>			0					
[org_form=1]	.181	.810	.050	1	.823	1.198	.245	5.863	
[org_form=2]	.999	.832	1.442	1	.230	2.715	.532	13.861	
[org_form=4]	0 <sup>b</sup>			0					

a. The reference category is: No interest / Interest.

b. This parameter is set to zero because it is redundant.



		Parameter Estimates					for Exp(B)		
adoption level of social media <sup>a</sup>		B	Std. Error	Wald	df	Sig.	Exp(B)	Lower Bound	Upper Bound
Adoption /	Intercept	.292	3.918	.006	1	.941			
Advanced	reach	.584	.220	7.037	1	.008	1.794	1.165	2.762
implementation	paid_fte	.032	.013	5.915	1	.015	1.032	1.006	1.059
	vol_fte	.008	.014	.309	1	.579	1.008	.980	1.037
	revenue_src1	-.006	.009	.504	1	.478	.994	.977	1.011
	revenue_src2	.005	.011	.226	1	.635	1.005	.983	1.028
	revenue_commercial	.001	.011	.004	1	.950	1.001	.979	1.023
	revenue_src8	-.010	.012	.729	1	.393	.990	.967	1.013
	used_skills_acquisition_num_cat	.468	.218	4.620	1	.032	1.596	1.042	2.444
	overall_skills_level_cat2	.155	.355	.192	1	.661	1.168	.583	2.341
	skills_acquisition_overall	.207	.206	1.011	1	.315	1.230	.822	1.841
	metadata_num	.049	.164	.088	1	.767	1.050	.762	1.446
	EPI2014	.030	1.045	.081	1	.776	1.030	.839	1.264
	GDP2012	-.136	.087	2.449	1	.118	.872	.735	1.035
	GLAMefuse_4methods	.453	1.147	.156	1	.693	1.573	.166	14.889
	[insttype_self=1]	.758	.700	1.172	1	.279	2.134	.541	8.411
	[insttype_self=2]	.354	.532	.443	1	.505	1.425	.503	4.040
	[insttype_self=3]	.606	.836	.525	1	.469	1.832	.356	9.433
	[insttype_self=4]	0 <sup>b</sup>			0				
	[obj1=0]	-.758	.463	2.680	1	.102	.468	.189	1.161
	[obj1=1]	0 <sup>b</sup>			0				
	[obj2=0]	-.193	.452	.183	1	.669	.824	.340	2.000
	[obj2=1]	0 <sup>b</sup>			0				
	[obj3=0]	.827	.407	4.123	1	.042	2.286	1.029	5.079
	[obj3=1]	0 <sup>b</sup>			0				
	[obj4=0]	-.645	.504	1.641	1	.200	.525	.196	1.407
	[obj4=1]	0 <sup>b</sup>			0				
	[obj5=0]	-.307	.515	.355	1	.551	.736	.268	2.018
	[obj5=1]	0 <sup>b</sup>			0				
	[obj6=0]	.432	.437	.978	1	.323	1.541	.654	3.631
	[obj6=1]	0 <sup>b</sup>			0				
	[obj7=0]	-.505	.400	1.592	1	.207	.604	.276	1.322
	[obj7=1]	0 <sup>b</sup>			0				
	[obj8=0]	-.195	.462	.179	1	.673	.823	.333	2.034
	[obj8=1]	0 <sup>b</sup>			0				
	[usr1=0]	-.150	.947	.025	1	.874	.861	.135	5.502
	[usr1=1]	0 <sup>b</sup>			0				
	[usr2=0]	.462	.486	.905	1	.342	1.588	.612	4.119
	[usr2=1]	0 <sup>b</sup>			0				
	[usr3=0]	-.600	.502	1.430	1	.232	.549	.205	1.467
	[usr3=1]	0 <sup>b</sup>			0				
	[usr4=0]	-.212	.428	.245	1	.621	.809	.349	1.873
	[usr4=1]	0 <sup>b</sup>			0				
	[usr5=0]	-.899	.655	1.881	1	.170	.407	.113	1.471
	[usr5=1]	0 <sup>b</sup>			0				
	[usr6=0]	-.217	.384	.320	1	.572	.805	.379	1.709
	[usr6=1]	0 <sup>b</sup>			0				
	[usr7=0]	.366	.414	.781	1	.377	1.442	.640	3.248
	[usr7=1]	0 <sup>b</sup>			0				
	[revenues_EUR_cat4=1.00]	-.199	.697	.081	1	.776	.820	.209	3.212
	[revenues_EUR_cat4=2.00]	.115	.661	.030	1	.862	1.122	.307	4.098
	[revenues_EUR_cat4=3.00]	.372	.785	.224	1	.636	1.450	.311	6.757
	[revenues_EUR_cat4=4.00]	0 <sup>b</sup>			0				
	[pct_vol_fte_cat3=1]	-.625	.717	.758	1	.384	.535	.131	2.184
	[pct_vol_fte_cat3=2]	-.139	.643	.047	1	.829	.871	.247	3.068
	[pct_vol_fte_cat3=3]	0 <sup>b</sup>			0				
	[org_form=1]	-.815	.698	1.364	1	.243	.443	.113	1.738
	[org_form=2]	-.689	.704	.958	1	.328	.502	.126	1.995
	[org_form=4]	0 <sup>b</sup>			0				

a. The reference category is: Evaluation / Trial.  
 b. This parameter is set to zero because it is redundant.

Parameter Estimates								
adoption level of open data <sup>a</sup>	B	Std. Error	Wald	df	Sig.	Exp(B)	for Exp(B)	
							Lower Bound	Upper Bound
Evaluation / Trial	Intercept	-3.646	3.954	.850	1	.357		
	reach	.058	.211	.076	1	.783	1.060	1.602
	paid_fte	-.003	.003	1.116	1	.291	.997	1.002
	vol_fte	.036	.018	4.081	1	.043	1.037	1.074
	revenue_src1	.004	.009	2.65	1	.607	1.004	.988
	revenue_src2	.009	.011	.644	1	.422	1.009	.987
	revenue_commercial	.007	.011	.361	1	.548	1.007	.985
	revenue_src8	-.004	.013	.119	1	.731	.996	.970
	used_skills_acquisition_num_cat3	.412	.218	3.568	1	.059	1.510	.985
	overall_skills_level_cat2	-.590	.367	2.588	1	.108	.554	.270
	skills_acquisition_overall	.342	.210	2.645	1	.104	1.407	.932
	metadata_num	2.168	.258	70.731	1	.000	8.738	5.273
	DIGI_adoption_cat6	.124	.157	.620	1	.431	1.132	.832
	EPI2014	.009	1.022	.007	1	.934	1.009	.826
	GDP2012	-.036	.078	.211	1	.646	.965	.828
	GLAMeffuse_4methods	.201	1.162	.030	1	.863	1.223	.125
	[inststpe_selfZ_3=1.00]	.982	.822	1.425	1	.233	2.669	.532
	[inststpe_selfZ_3=2.00]	.358	.841	.181	1	.671	1.430	.275
	[inststpe_selfZ_3=4.00]	1.497	.910	2.705	1	.100	4.469	.751
	[inststpe_selfZ_3=93.00]	0 <sup>b</sup>			0			
	[obj1=0]	.542	.462	1.378	1	.241	1.719	.696
	[obj1=1]	0 <sup>b</sup>			0			
	[obj2=0]	-.184	.461	.159	1	.690	.832	.337
	[obj2=1]	0 <sup>b</sup>			0			
	[obj3=0]	-.027	.398	.005	1	.945	.973	.446
	[obj3=1]	0 <sup>b</sup>			0			
	[obj4=0]	-.416	.532	.610	1	.435	.660	.232
	[obj4=1]	0 <sup>b</sup>			0			
	[obj5=0]	.364	.523	.483	1	.487	1.438	.516
	[obj5=1]	0 <sup>b</sup>			0			
	[obj6=0]	.309	.434	.506	1	.477	1.361	.582
	[obj6=1]	0 <sup>b</sup>			0			
	[obj7=0]	.107	.413	.067	1	.796	1.113	.495
	[obj7=1]	0 <sup>b</sup>			0			
	[obj8=0]	-.235	.444	.280	1	.597	.790	.331
	[obj8=1]	0 <sup>b</sup>			0			
	[usr1=0]	1.037	1.073	.935	1	.333	2.822	.345
	[usr1=1]	0 <sup>b</sup>			0			
	[usr2=0]	.515	.497	1.074	1	.300	1.674	.632
	[usr2=1]	0 <sup>b</sup>			0			
	[usr3=0]	-.672	.506	1.762	1	.184	.511	.189
	[usr3=1]	0 <sup>b</sup>			0			
	[usr4=0]	-.719	.427	2.835	1	.092	.487	.211
	[usr4=1]	0 <sup>b</sup>			0			
	[usr5=0]	.500	.543	.851	1	.356	1.649	.570
	[usr5=1]	0 <sup>b</sup>			0			
	[usr6=0]	.140	.391	.128	1	.721	1.150	.535
	[usr6=1]	0 <sup>b</sup>			0			
	[usr7=0]	.239	.420	.323	1	.570	1.269	.558
	[usr7=1]	0 <sup>b</sup>			0			
	[revenues_EUR_cat4=1.00]	-.640	.619	1.071	1	.301	.527	.157
	[revenues_EUR_cat4=2.00]	-.966	.589	2.687	1	.101	.381	.120
	[revenues_EUR_cat4=3.00]	-.581	.700	.688	1	.407	.559	.142
	[revenues_EUR_cat4=4.00]	0 <sup>b</sup>			0			
	[pct_vol_fte_cat3=1]	.056	.697	.006	1	.936	1.057	.269
	[pct_vol_fte_cat3=2]	-.356	.612	.338	1	.561	.701	.211
	[pct_vol_fte_cat3=3]	0 <sup>b</sup>			0			
	[org_form=1]	-.454	.632	.515	1	.473	.635	.184
	[org_form=2]	-.578	.675	.734	1	.391	.561	.150
	[org_form=4]	0 <sup>b</sup>			0			

a. The reference category is: No interest / Interest.

b. This parameter is set to zero because it is redundant.

Parameter Estimates									
adoption level of open data <sup>a</sup>		B	Std. Error	Wald	df	Sig.	Exp(B)	for Exp(B)	
								Lower Bound	Upper Bound
Adoption /	Intercept	2.140	3.087	.481	1	.488			
Advanced	reach	-.009	.165	.003	1	.957	.991	.717	1.370
implementa	paid_fte	.001	.002	.312	1	.577	1.001	.998	1.004
tion	vol_fte	.002	.006	.195	1	.659	1.002	.992	1.014
	revenue_src1	-.002	.007	.078	1	.780	.998	.985	1.012
	revenue_src2	.005	.009	.329	1	.566	1.005	.988	1.023
	revenue_commercial	-.007	.009	.676	1	.411	.993	.976	1.010
	revenue_src8	-.015	.012	1.549	1	.213	.985	.962	1.009
	used_skills_acquisition_num_cat3	.192	.183	1.107	1	.293	1.212	.847	1.733
	overall_skills_level_cat2	.985	.297	11.000	1	.001	2.677	1.496	4.789
	skills_acquisition_overall	-.068	.183	.139	1	.709	.934	.652	1.337
	metadata_num	-.174	.147	1.409	1	.235	.840	.630	1.120
	DIGI_adoption_cat6	.106	.146	.526	1	.468	1.112	.835	1.481
	EPI2014	0.234	.829	7.995	1	.005	1.264	1.075	1.487
	GDP2012	-.095	.067	2.024	1	.155	.910	.798	1.036
	GLAMeffuse_4methods	-1.155	.906	1.625	1	.202	.315	.053	1.861
	[insttype_selfZ_3=1.00]	-1.281	.593	4.661	1	.031	.278	.087	.889
	[insttype_selfZ_3=2.00]	-1.912	.653	8.566	1	.003	.148	.041	.532
	[insttype_selfZ_3=4.00]	-1.432	.642	4.975	1	.026	.239	.068	.841
	[insttype_selfZ_3=93.00]	0 <sup>b</sup>			0				
	[obj1=0]	-.303	.395	.590	1	.442	.738	.340	1.601
	[obj1=1]	0 <sup>b</sup>			0				
	[obj2=0]	-.098	.384	.066	1	.798	.906	.427	1.924
	[obj2=1]	0 <sup>b</sup>			0				
	[obj3=0]	.449	.328	1.868	1	.172	1.566	.823	2.980
	[obj3=1]	0 <sup>b</sup>			0				
	[obj4=0]	.366	.414	.779	1	.377	1.442	.640	3.248
	[obj4=1]	0 <sup>b</sup>			0				
	[obj5=0]	-.089	.500	.032	1	.859	.915	.344	2.436
	[obj5=1]	0 <sup>b</sup>			0				
	[obj6=0]	-.467	.370	1.596	1	.206	.627	.304	1.294
	[obj6=1]	0 <sup>b</sup>			0				
	[obj7=0]	.263	.315	.697	1	.404	1.301	.701	2.414
	[obj7=1]	0 <sup>b</sup>			0				
	[obj8=0]	-.243	.323	.566	1	.452	.784	.416	1.477
	[obj8=1]	0 <sup>b</sup>			0				
	[usr1=0]	-.229	.746	.094	1	.759	.795	.184	3.432
	[usr1=1]	0 <sup>b</sup>			0				
	[usr2=0]	-.397	.423	.881	1	.348	.672	.293	1.541
	[usr2=1]	0 <sup>b</sup>			0				
	[usr3=0]	.364	.377	.931	1	.335	1.439	.687	3.016
	[usr3=1]	0 <sup>b</sup>			0				
	[usr4=0]	.683	.352	3.757	1	.053	1.980	.992	3.952
	[usr4=1]	0 <sup>b</sup>			0				
	[usr5=0]	-.554	.414	1.786	1	.181	.575	.255	1.295
	[usr5=1]	0 <sup>b</sup>			0				
	[usr6=0]	-.231	.332	.485	1	.486	.794	.414	1.521
	[usr6=1]	0 <sup>b</sup>			0				
	[usr7=0]	-.440	.353	1.552	1	.213	.644	.322	1.287
	[usr7=1]	0 <sup>b</sup>			0				
	[revenues_EUR_cat4=1.00]	.314	.481	.426	1	.514	1.368	.533	3.510
	[revenues_EUR_cat4=2.00]	.521	.439	1.411	1	.235	1.684	.713	3.980
	[revenues_EUR_cat4=3.00]	.279	.541	.266	1	.606	1.322	.458	3.818
	[revenues_EUR_cat4=4.00]	0 <sup>b</sup>			0				
	[pct_vol_fte_cat3=1]	.833	.622	1.795	1	.180	2.300	.680	7.780
	[pct_vol_fte_cat3=2]	.608	.569	1.139	1	.286	1.836	.602	5.604
	[pct_vol_fte_cat3=3]	0 <sup>b</sup>			0				
	[org_form=1]	-.382	.542	.497	1	.481	.682	.236	1.974
	[org_form=2]	.021	.588	.001	1	.972	1.021	.323	3.229
	[org_form=4]	0 <sup>b</sup>			0				

a. The reference category is: Evaluation / Trial.

b. This parameter is set to zero because it is redundant.

Parameter Estimates									
adoption level of open content <sup>a</sup>		B	Std. Error	Wald	df	Sig.	Exp(B)	for Exp(B)	
								Lower Bound	Upper Bound
Evaluation / Trial	Intercept	.755	3.069	.060	1	.806			
	reach	.188	.165	1.305	1	.253	1.207	.874	1.668
	paid_fte	.000	.003	.013	1	.909	1.000	.994	1.005
	vol_fte	.002	.008	.050	1	.824	1.002	.986	1.017
	revenue_src1	.000	.007	.003	1	.953	1.000	.987	1.014
	revenue_src2	-.001	.009	.029	1	.864	.999	.982	1.015
	revenue_commercial	.006	.010	.375	1	.540	1.006	.987	1.026
	revenue_src3	.003	.010	.071	1	.791	1.003	.983	1.023
	used_skills_acquisition_num_cat3	.162	.172	.891	1	.345	1.176	.840	1.648
	overall_skills_level_cat2	-.083	.289	.083	1	.773	.920	.522	1.621
	skills_acquisition_overall	.319	.167	3.660	1	.056	1.375	.992	1.906
	metadata_num	.383	.135	8.009	1	.005	1.467	1.125	1.913
	DIGI_adoption_cat6	.356	.127	7.811	1	.005	1.427	1.112	1.832
	SM_adoption_cat6	.313	.111	7.937	1	.005	1.367	1.100	1.700
	EPI2014	-.088	.841	1.097	1	.295	.916	.776	1.080
	GDP2012	-.045	.067	.449	1	.503	.956	.839	1.090
	GLAMeffuse_4methods	-1.304	.927	1.979	1	.159	.271	.044	1.670
	[insttype_selfZ_2=1.00]	.398	.571	.486	1	.486	1.489	.486	4.557
	[insttype_selfZ_2=3.00]	.813	.635	1.639	1	.201	2.256	.649	7.836
	[insttype_selfZ_2=4.00]	1.167	.484	5.800	1	.016	3.211	1.243	8.300
	[insttype_selfZ_2=92.00]	0 <sup>b</sup>			0				
	[obj1=0]	.540	.387	1.944	1	.163	1.716	.803	3.665
	[obj1=1]	0 <sup>b</sup>			0				
	[obj2=0]	.491	.367	1.783	1	.182	1.633	.795	3.356
	[obj2=1]	0 <sup>b</sup>			0				
	[obj3=0]	-.469	.310	2.289	1	.130	.625	.340	1.149
	[obj3=1]	0 <sup>b</sup>			0				
	[obj4=0]	-.605	.427	2.004	1	.157	.546	.236	1.262
	[obj4=1]	0 <sup>b</sup>			0				
	[obj5=0]	-.399	.418	.907	1	.341	.671	.296	1.524
	[obj5=1]	0 <sup>b</sup>			0				
	[obj6=0]	.089	.353	.064	1	.800	1.093	.547	2.184
	[obj6=1]	0 <sup>b</sup>			0				
	[obj7=0]	.222	.311	.508	1	.476	1.248	.679	2.295
	[obj7=1]	0 <sup>b</sup>			0				
	[obj8=0]	-.136	.337	.163	1	.687	.873	.451	1.691
	[obj8=1]	0 <sup>b</sup>			0				
	[usr1=0]	1.751	.886	3.910	1	.048	5.762	1.016	32.690
	[usr1=1]	0 <sup>b</sup>			0				
	[usr2=0]	.028	.394	.005	1	.943	1.029	.476	2.225
[usr2=1]	0 <sup>b</sup>			0					
[usr3=0]	-.345	.372	.856	1	.355	.708	.341	1.470	
[usr3=1]	0 <sup>b</sup>			0					
[usr4=0]	.103	.332	.097	1	.756	1.109	.578	2.126	
[usr4=1]	0 <sup>b</sup>			0					
[usr5=0]	.245	.427	.329	1	.566	1.278	.553	2.951	
[usr5=1]	0 <sup>b</sup>			0					
[usr6=0]	.623	.312	3.993	1	.046	1.864	1.012	3.433	
[usr6=1]	0 <sup>b</sup>			0					
[usr7=0]	-.291	.332	.770	1	.380	.747	.390	1.433	
[usr7=1]	0 <sup>b</sup>			0					
[revenues_EUR_cat4=1.00]	-.144	.504	.081	1	.776	.866	.322	2.327	
[revenues_EUR_cat4=2.00]	-.011	.467	.001	1	.981	.989	.396	2.470	
[revenues_EUR_cat4=3.00]	-.202	.552	.134	1	.714	.817	.277	2.411	
[revenues_EUR_cat4=4.00]	0 <sup>b</sup>			0					
[pct_vol_fte_cat3=1]	-.636	.561	1.283	1	.257	.530	.176	1.590	
[pct_vol_fte_cat3=2]	-.208	.521	.159	1	.690	.812	.292	2.257	
[pct_vol_fte_cat3=3]	0 <sup>b</sup>			0					
[org_form=1]	.944	.491	3.686	1	.055	2.569	.981	6.731	
[org_form=2]	.508	.521	.950	1	.330	1.662	.599	4.612	
[org_form=4]	0 <sup>b</sup>			0					

a. The reference category is: No interest / Interest.

b. This parameter is set to zero because it is redundant.

		Parameter Estimates							
		B	Std. Error	Wald	df	Sig.	Exp(B)	for Exp(B)	
								Lower Bound	Upper Bound
adoption level of open content <sup>a</sup>									
Adoption / Advanced implementation	Intercept	-3.079	3.537	.758	1	.384			
	reach	-.220	.193	1.297	1	.255	.803	.550	1.172
	paid_fte	.001	.002	.706	1	.401	1.001	.998	1.005
	vol_fte	.001	.005	.028	1	.867	1.001	.991	1.011
	revenue_src1	-.009	.007	1.586	1	.208	.991	.977	1.005
	revenue_src2	-.004	.010	.136	1	.712	.996	.978	1.015
	revenue_commercial	.007	.009	.618	1	.432	1.007	.990	1.024
	revenue_src8	-.008	.011	.543	1	.461	.992	.970	1.014
	used_skills_acquisition_num_cat3	-.094	.208	.202	1	.653	.911	.605	1.370
	overall_skills_level_cat2	.646	.338	3.640	1	.056	1.908	.983	3.703
	skills_acquisition_overall	.039	.207	.036	1	.849	1.040	.693	1.561
	metadata_num	-.283	.157	3.235	1	.072	.753	.553	1.026
	DIGI_adoption_cat6	.820	.206	15.869	1	.000	2.270	1.517	3.398
	SM_adoption_cat6	.315	.154	4.200	1	.040	1.370	1.014	1.851
	EPI2014	0.125	.867	2.093	1	.148	1.134	.956	1.344
	GDP2012	-.013	.077	.029	1	.865	.987	.849	1.147
	GLAMefuse_4methods	-.465	1.052	.195	1	.659	.628	.080	4.940
	[insttype_selfZ_2=1.00]	-.376	.655	.329	1	.566	.687	.190	2.480
	[insttype_selfZ_2=3.00]	-.658	.778	.717	1	.397	.518	.113	2.376
	[insttype_selfZ_2=4.00]	-.122	.461	.070	1	.791	.885	.358	2.185
	[insttype_selfZ_2=92.00]	0 <sup>b</sup>			0				
	[obj1=0]	.238	.430	.307	1	.580	1.269	.547	2.944
	[obj1=1]	0 <sup>b</sup>			0				
	[obj2=0]	-.179	.423	.179	1	.672	.836	.365	1.917
	[obj2=1]	0 <sup>b</sup>			0				
	[obj3=0]	-.639	.386	2.740	1	.098	.528	.248	1.125
	[obj3=1]	0 <sup>b</sup>			0				
	[obj4=0]	.709	.482	2.159	1	.142	2.031	.789	5.228
	[obj4=1]	0 <sup>b</sup>			0				
	[obj5=0]	.624	.551	1.281	1	.258	1.866	.633	5.499
	[obj5=1]	0 <sup>b</sup>			0				
	[obj6=0]	-.521	.391	1.773	1	.183	.594	.276	1.279
	[obj6=1]	0 <sup>b</sup>			0				
	[obj7=0]	.132	.369	.128	1	.720	1.141	.554	2.353
	[obj7=1]	0 <sup>b</sup>			0				
	[obj8=0]	.100	.375	.072	1	.789	1.106	.530	2.307
	[obj8=1]	0 <sup>b</sup>			0				
	[usr1=0]	.710	.832	.729	1	.393	2.035	.398	10.398
	[usr1=1]	0 <sup>b</sup>			0				
	[usr2=0]	-.196	.486	.163	1	.686	.822	.317	2.130
[usr2=1]	0 <sup>b</sup>			0					
[usr3=0]	.066	.424	.024	1	.877	1.068	.466	2.449	
[usr3=1]	0 <sup>b</sup>			0					
[usr4=0]	.006	.407	.000	1	.988	1.006	.453	2.233	
[usr4=1]	0 <sup>b</sup>			0					
[usr5=0]	-.548	.440	1.556	1	.212	.578	.244	1.368	
[usr5=1]	0 <sup>b</sup>			0					
[usr6=0]	.256	.379	.456	1	.499	1.292	.614	2.717	
[usr6=1]	0 <sup>b</sup>			0					
[usr7=0]	-.367	.394	.867	1	.352	.693	.320	1.500	
[usr7=1]	0 <sup>b</sup>			0					
[revenues_EUR_cat4=1.00]	.193	.561	.118	1	.731	1.212	.404	3.640	
[revenues_EUR_cat4=2.00]	-.036	.501	.005	1	.943	.965	.361	2.574	
[revenues_EUR_cat4=3.00]	-.278	.635	.191	1	.662	.758	.218	2.630	
[revenues_EUR_cat4=4.00]	0 <sup>b</sup>			0					
[pct_vol_fte_cat3=1]	-.535	.638	.703	1	.402	.586	.168	2.045	
[pct_vol_fte_cat3=2]	-.300	.565	.283	1	.595	.740	.245	2.240	
[pct_vol_fte_cat3=3]	0 <sup>b</sup>			0					
[org_form=1]	-.831	.539	2.376	1	.123	.436	.152	1.253	
[org_form=2]	-.885	.588	2.266	1	.132	.413	.130	1.306	
[org_form=4]	0 <sup>b</sup>			0					

a. The reference category is: Evaluation / Trial.  
 b. This parameter is set to zero because it is redundant.

Parameter Estimates (PSM14)									
adoption level of collaborative content creation <sup>a</sup>		B	Std. Error	Wald	df	Sig.	Exp(B)	for Exp(B)	
								Lower Bound	Upper Bound
Evaluation / Trial	Intercept	-1.414	4.573	.096	1	.757			
	reach	.421	.241	3.052	1	.081	1.523	.950	2.442
	paid_fte	.001	.006	.009	1	.924	1.001	.988	1.013
	vol_fte	.022	.014	2.320	1	.128	1.022	.994	1.051
	revenue_src1	.016	.011	2.141	1	.143	1.016	.995	1.038
	revenue_src2	.023	.013	3.114	1	.078	1.023	.998	1.049
	revenue_commercial	.014	.014	1.023	1	.312	1.014	.987	1.043
	revenue_src8	.016	.014	1.324	1	.250	1.016	.989	1.044
	used_skills_acquisition_num_cat3	.532	.272	3.827	1	.050	1.702	.999	2.900
	overall_skills_level_cat2	-.714	.434	2.705	1	.100	.490	.209	1.147
	skills_acquisition_overall	-.098	.252	.152	1	.697	.906	.553	1.486
	metadata_num	.010	.197	.003	1	.958	1.010	.686	1.488
	DIGI_adoption_cat6	-.011	.193	.004	1	.953	.989	.677	1.444
	SM_adoption_cat6	.531	.184	8.310	1	.004	1.701	1.185	2.440
	EPI2014	-.007	1.241	.003	1	.957	.993	.779	1.267
	GDP2012	-.076	.091	.709	1	.400	.927	.776	1.107
	GLAMeffuse_4methods	-.316	1.410	.050	1	.823	.729	.046	11.562
	[insttype_selfZ_3=1.00]	-.197	.867	.052	1	.820	.821	.150	4.487
	[insttype_selfZ_3=2.00]	-.228	1.053	.047	1	.829	.796	.101	6.272
	[insttype_selfZ_3=4.00]	-.228	1.040	.048	1	.827	.796	.104	6.111
	[insttype_selfZ_3=93.00]	0 <sup>b</sup>			0				
	[obj1=0]	.290	.547	.281	1	.596	1.336	.457	3.906
	[obj1=1]	0 <sup>b</sup>			0				
	[obj2=0]	.717	.522	1.886	1	.170	2.049	.736	5.702
	[obj2=1]	0 <sup>b</sup>			0				
	[obj3=0]	-.485	.476	1.039	1	.308	.616	.242	1.565
	[obj3=1]	0 <sup>b</sup>			0				
	[obj4=0]	-.464	.702	.436	1	.509	.629	.159	2.489
	[obj4=1]	0 <sup>b</sup>			0				
	[obj5=0]	.606	.770	.619	1	.431	1.833	.405	8.295
	[obj5=1]	0 <sup>b</sup>			0				
	[obj6=0]	.284	.535	.281	1	.596	1.328	.465	3.793
	[obj6=1]	0 <sup>b</sup>			0				
	[obj7=0]	-.377	.486	.603	1	.437	.686	.265	1.777
	[obj7=1]	0 <sup>b</sup>			0				
	[obj8=0]	-.135	.464	.085	1	.771	.874	.352	2.170
	[obj8=1]	0 <sup>b</sup>			0				
	[usr2=0]	-.398	.574	.481	1	.488	.671	.218	2.070
	[usr2=1]	0 <sup>b</sup>			0				
	[usr3=0]	-.016	.551	.001	1	.976	.984	.334	2.894
[usr3=1]	0 <sup>b</sup>			0					
[usr4=0]	.300	.500	.360	1	.549	1.349	.507	3.591	
[usr4=1]	0 <sup>b</sup>			0					
[usr5=0]	.716	.592	1.462	1	.227	2.047	.641	6.536	
[usr5=1]	0 <sup>b</sup>			0					
[usr6=0]	-.048	.458	.011	1	.916	.953	.388	2.339	
[usr6=1]	0 <sup>b</sup>			0					
[usr7=0]	-.265	.473	.313	1	.576	.768	.304	1.940	
[usr7=1]	0 <sup>b</sup>			0					
[revenues_EUR_cat4Z_3=1.00]	-1.292	.802	2.595	1	.107	.275	.057	1.323	
[revenues_EUR_cat4Z_3=2.00]	-1.193	.772	2.392	1	.122	.303	.067	1.376	
[revenues_EUR_cat4Z_3=4.00]	-1.024	.839	1.492	1	.222	.359	.069	1.858	
[revenues_EUR_cat4Z_3=93.00]	0 <sup>b</sup>			0					
[pct_vol_fte_cat3=1]	-2.014	.939	4.599	1	.032	.133	.021	.841	
[pct_vol_fte_cat3=2]	-2.059	.878	5.504	1	.019	.128	.023	.713	
[pct_vol_fte_cat3=3]	0 <sup>b</sup>			0					
[org_formZ_2=1.00]	.542	.626	.749	1	.387	1.720	.504	5.871	
[org_formZ_2=4.00]	.710	.883	.647	1	.421	2.035	.360	11.490	
[org_formZ_2=92.00]	0 <sup>b</sup>			0					

a. The reference category is: No interest / Interest.

b. This parameter is set to zero because it is redundant.

Parameter Estimates (PSM14)									
adoption level of collaborative content creation <sup>a</sup>		B	Std. Error	Wald	df	Sig.	Exp(B)	for Exp(B)	
								Lower Bound	Upper Bound
Adoption / Advanced implementa tion	Intercept	-20.526	7.762	6.994	1	.008			
	reach	-.181	.347	.272	1	.602	.834	.422	1.648
	paid_fte	.017	.008	4.595	1	.032	1.017	1.001	1.033
	vol_fte	-.017	.017	1.018	1	.313	.983	.952	1.016
	revenue_src1	-.011	.015	.504	1	.478	.989	.960	1.019
	revenue_src2	-.034	.020	2.945	1	.086	.967	.930	1.005
	revenue_commercial	-.001	.019	.004	1	.952	.999	.962	1.037
	revenue_src8	-.024	.019	1.617	1	.203	.976	.940	1.013
	used_skills_acquisition_num_cat3	-.022	.439	.002	1	.960	.978	.414	2.313
	overall_skills_level_cat2	1.868	.647	8.344	1	.004	6.474	1.823	22.994
	skills_acquisition_overall	.173	.380	.207	1	.649	1.189	.565	2.501
	metadata_num	-.132	.330	.159	1	.690	.877	.459	1.675
	DIGI_adoption_cat6	-.147	.290	.257	1	.612	.863	.489	1.525
	SM_adoption_cat6	.335	.364	.849	1	.357	1.398	.685	2.852
	EPI2014	-.053	1.765	.090	1	.765	.949	.671	1.341
	GDP2012	-.026	1.139	.036	1	.850	.974	.742	1.278
	GLAMeffuse_4methods	2.854	2.204	1.676	1	.195	17.352	.231	1305.081
	[insttype_selfZ_3=1.00]	3.848	1.435	7.191	1	.007	46.888	2.817	780.546
	[insttype_selfZ_3=2.00]	4.150	1.704	5.935	1	.015	63.441	2.251	1788.292
	[insttype_selfZ_3=4.00]	3.931	1.724	5.197	1	.023	50.963	1.735	1496.612
	[insttype_selfZ_3=93.00]	0 <sup>b</sup>			0				
	[obj1=0]	-.608	.748	.660	1	.417	.545	.126	2.360
	[obj1=1]	0 <sup>b</sup>			0				
	[obj2=0]	1.063	.767	1.921	1	.166	2.895	.644	13.020
	[obj2=1]	0 <sup>b</sup>			0				
	[obj3=0]	.701	.727	.931	1	.335	2.016	.485	8.382
	[obj3=1]	0 <sup>b</sup>			0				
	[obj4=0]	.967	1.026	.888	1	.346	2.630	.352	19.662
	[obj4=1]	0 <sup>b</sup>			0				
	[obj5=0]	1.546	1.224	1.594	1	.207	4.691	.426	51.653
	[obj5=1]	0 <sup>b</sup>			0				
	[obj6=0]	1.061	.908	1.365	1	.243	2.889	.487	17.118
	[obj6=1]	0 <sup>b</sup>			0				
	[obj7=0]	.204	.680	.090	1	.765	1.226	.323	4.648
	[obj7=1]	0 <sup>b</sup>			0				
	[obj8=0]	.569	.732	.604	1	.437	1.766	.421	7.414
	[obj8=1]	0 <sup>b</sup>			0				
	[usr2=0]	-1.392	1.150	1.466	1	.226	.248	.026	2.368
	[usr2=1]	0 <sup>b</sup>			0				
	[usr3=0]	-.237	.755	.099	1	.753	.789	.180	3.464
[usr3=1]	0 <sup>b</sup>			0					
[usr4=0]	-1.329	.698	3.628	1	.057	.265	.067	1.039	
[usr4=1]	0 <sup>b</sup>			0					
[usr5=0]	.704	.874	.649	1	.420	2.022	.365	11.218	
[usr5=1]	0 <sup>b</sup>			0					
[usr6=0]	.138	.681	.041	1	.839	1.148	.302	4.366	
[usr6=1]	0 <sup>b</sup>			0					
[usr7=0]	.486	.696	.487	1	.485	1.626	.415	6.364	
[usr7=1]	0 <sup>b</sup>			0					
[revenues_EUR_cat4Z_3=1.00]	1.054	1.113	.897	1	.344	2.868	.324	25.389	
[revenues_EUR_cat4Z_3=2.00]	-.582	1.071	.295	1	.587	.559	.069	4.560	
[revenues_EUR_cat4Z_3=4.00]	-.130	1.136	.013	1	.909	.878	.095	8.143	
[revenues_EUR_cat4Z_3=93.00]	0 <sup>b</sup>			0					
[pct_vol_fte_cat3=1]	1.269	1.482	.733	1	.392	3.557	.195	64.932	
[pct_vol_fte_cat3=2]	2.805	1.375	4.164	1	.041	16.534	1.117	244.701	
[pct_vol_fte_cat3=3]	0 <sup>b</sup>			0					
[org_formZ_2=1.00]	-1.065	.917	1.349	1	.245	.345	.057	2.080	
[org_formZ_2=4.00]	-1.167	1.326	.774	1	.379	.311	.023	4.190	
[org_formZ_2=92.00]	0 <sup>b</sup>			0					

a. The reference category is: Evaluation / Trial.

b. This parameter is set to zero because it is redundant.

Parameter Estimates								
adoption level of linked data <sup>a</sup>	B	Std. Error	Wald	df	Sig.	Exp(B)	for Exp(B)	
							Lower Bound	Upper Bound
Evaluation / Trial								
Intercept	-1.930	3.313	.339	1	.560			
reach	.003	.172	.000	1	.985	1.003	.716	1.405
paid_fte	-.001	.004	.024	1	.877	.999	.992	1.007
vol_fte	-.001	.007	.046	1	.830	.999	.986	1.012
revenue_src1	-.010	.007	2.042	1	.153	.990	.976	1.004
revenue_src2	-.005	.009	.246	1	.620	.995	.978	1.013
revenue_commercial	-.015	.009	2.572	1	.109	.985	.967	1.003
revenue_src8	-.008	.011	.537	1	.464	.992	.971	1.013
used_skills_acquisition_num_cat3	.195	.185	1.112	1	.292	1.215	.846	1.745
overall_skills_level_cat2	-.364	.305	1.420	1	.233	.695	.382	1.264
skills_acquisition_overall	.023	.180	.017	1	.897	1.024	.720	1.455
metadata_num	.927	.149	38.433	1	.000	2.526	1.885	3.387
OD_adoption_cat6	.232	.105	4.875	1	.027	1.261	1.026	1.550
DIGI_adoption_cat6	.134	.150	.795	1	.373	1.143	.852	1.535
SM_adoption_cat6	.041	.120	.114	1	.735	1.042	.823	1.319
EPI2014	0.183	.918	3.996	1	.046	1.201	1.004	1.438
GDP2012	.046	.073	.399	1	.528	1.047	.908	1.208
GLAMefuse_4methods	-.793	.986	.646	1	.421	.453	.066	3.125
[insttype_self=1]	-.044	.569	.006	1	.939	.957	.314	2.921
[insttype_self=2]	-.229	.425	.291	1	.589	.795	.346	1.828
[insttype_self=3]	.086	.700	.015	1	.902	1.090	.277	4.295
[insttype_self=4]	0 <sup>b</sup>			0				
[obj1=0]	-.025	.415	.004	1	.952	.975	.433	2.198
[obj1=1]	0 <sup>b</sup>			0				
[obj2=0]	.177	.392	.205	1	.651	1.194	.554	2.576
[obj2=1]	0 <sup>b</sup>			0				
[obj3=0]	-.028	.342	.007	1	.934	.972	.498	1.898
[obj3=1]	0 <sup>b</sup>			0				
[obj4=0]	-.290	.449	.417	1	.518	.748	.310	1.805
[obj4=1]	0 <sup>b</sup>			0				
[obj5=0]	-.655	.470	1.941	1	.164	.519	.207	1.306
[obj5=1]	0 <sup>b</sup>			0				
[obj6=0]	-.047	.372	.016	1	.900	.954	.460	1.978
[obj6=1]	0 <sup>b</sup>			0				
[obj7=0]	-.197	.321	.377	1	.539	.821	.437	1.541
[obj7=1]	0 <sup>b</sup>			0				
[obj8=0]	.365	.346	1.116	1	.291	1.441	.732	2.837
[obj8=1]	0 <sup>b</sup>			0				
[usr1=0]	-.616	.815	.572	1	.450	.540	.109	2.668
[usr1=1]	0 <sup>b</sup>			0				
[usr2=0]	.606	.416	2.123	1	.145	1.833	.811	4.143
[usr2=1]	0 <sup>b</sup>			0				
[usr3=0]	.274	.399	.471	1	.493	1.315	.602	2.872
[usr3=1]	0 <sup>b</sup>			0				
[usr4=0]	-.593	.355	2.796	1	.095	.553	.276	1.107
[usr4=1]	0 <sup>b</sup>			0				
[usr5=0]	.056	.439	.016	1	.898	1.058	.447	2.503
[usr5=1]	0 <sup>b</sup>			0				
[usr6=0]	.680	.334	4.143	1	.042	1.973	1.025	3.797
[usr6=1]	0 <sup>b</sup>			0				
[usr7=0]	-.153	.348	.193	1	.660	.858	.434	1.697
[usr7=1]	0 <sup>b</sup>			0				
[revenues_EUR_cat4=1.00]	-.359	.527	.464	1	.496	.698	.248	1.963
[revenues_EUR_cat4=2.00]	-.612	.481	1.623	1	.203	.542	.211	1.391
[revenues_EUR_cat4=3.00]	-.142	.550	.067	1	.796	.868	.295	2.549
[revenues_EUR_cat4=4.00]	0 <sup>b</sup>			0				
[pct_vol_fte_cat3=1]	1.299	.640	4.112	1	.043	3.664	1.044	12.858
[pct_vol_fte_cat3=2]	.633	.591	1.150	1	.284	1.884	.592	5.995
[pct_vol_fte_cat3=3]	0 <sup>b</sup>			0				
[org_form=1]	.737	.558	1.743	1	.187	2.090	.700	6.241
[org_form=2]	.191	.607	.099	1	.753	1.211	.368	3.981
[org_form=4]	0 <sup>b</sup>			0				

a. The reference category is: No interest / Interest.

b. This parameter is set to zero because it is redundant.



Parameter Estimates									
		B	Std. Error	Wald	df	Sig.	Exp(B)	for Exp(B)	
								Lower Bound	Upper Bound
adoption level of linked data <sup>a</sup>									
Adoption / Advanced implementation	Intercept	-6.418	5.440	1.392	1	.238			
	reach	-.091	.296	.095	1	.758	.913	.511	1.630
	paid_fte	.008	.005	2.653	1	.103	1.008	.998	1.018
	vol_fte	.007	.008	.617	1	.432	1.007	.990	1.024
	revenue_src1	.008	.013	.377	1	.539	1.008	.983	1.034
	revenue_src2	-.009	.022	.162	1	.687	.991	.949	1.035
	revenue_commercial	.024	.015	2.562	1	.109	1.025	.995	1.056
	revenue_src8	-.008	.027	.082	1	.775	.992	.941	1.046
	used_skills_acquisition_num_cat3	.024	.369	.004	1	.949	1.024	.497	2.109
	overall_skills_level_cat2	1.066	.554	3.708	1	.054	2.904	.981	8.596
	skills_acquisition_overall	-.132	.355	.139	1	.709	.876	.437	1.756
	metadata_num	-.441	.298	2.187	1	.139	.643	.358	1.154
	OD_adoption_cat6	.590	.231	6.511	1	.011	1.804	1.147	2.839
	DIGI_adoption_cat6	.609	.349	3.051	1	.081	1.839	.928	3.641
	SM_adoption_cat6	.662	.292	5.144	1	.023	1.939	1.094	3.437
	EPI2014	-.054	1.543	.124	1	.725	.947	.700	1.282
	GDP2012	-.031	.122	.065	1	.799	.970	.764	1.230
	GLAMeffuse_4methods	-1.512	1.635	.856	1	.355	.220	.009	5.430
	[insttype_self=1]	-.706	1.063	.441	1	.507	.494	.062	3.962
	[insttype_self=2]	1.025	.900	1.296	1	.255	2.786	.478	16.256
	[insttype_self=3]	.601	1.077	.311	1	.577	1.824	.221	15.066
	[insttype_self=4]	0 <sup>b</sup>			0				
	[obj1=0]	.187	.767	.060	1	.807	1.206	.268	5.424
	[obj1=1]	0 <sup>b</sup>			0				
	[obj2=0]	-1.128	.748	2.276	1	.131	.324	.075	1.401
	[obj2=1]	0 <sup>b</sup>			0				
	[obj3=0]	-.667	.610	1.195	1	.274	.513	.155	1.697
	[obj3=1]	0 <sup>b</sup>			0				
	[obj4=0]	1.871	.834	5.032	1	.025	6.492	1.266	33.283
	[obj4=1]	0 <sup>b</sup>			0				
	[obj5=0]	.972	1.017	.913	1	.339	2.642	.360	19.397
	[obj5=1]	0 <sup>b</sup>			0				
	[obj6=0]	.058	.739	.006	1	.937	1.060	.249	4.507
	[obj6=1]	0 <sup>b</sup>			0				
	[obj7=0]	.932	.628	2.200	1	.138	2.539	.741	8.695
	[obj7=1]	0 <sup>b</sup>			0				
	[obj8=0]	-1.133	.632	3.210	1	.073	.322	.093	1.112
	[obj8=1]	0 <sup>b</sup>			0				
	[usr1=0]	.035	1.316	.001	1	.979	1.036	.079	13.651
	[usr1=1]	0 <sup>b</sup>			0				
[usr2=0]	-.949	.958	.981	1	.322	.387	.059	2.531	
[usr2=1]	0 <sup>b</sup>			0					
[usr3=0]	-.432	.693	.389	1	.533	.649	.167	2.524	
[usr3=1]	0 <sup>b</sup>			0					
[usr4=0]	-.401	.706	.322	1	.571	.670	.168	2.674	
[usr4=1]	0 <sup>b</sup>			0					
[usr5=0]	-.325	.705	.212	1	.645	.723	.182	2.876	
[usr5=1]	0 <sup>b</sup>			0					
[usr6=0]	-.165	.656	.063	1	.801	.848	.234	3.069	
[usr6=1]	0 <sup>b</sup>			0					
[usr7=0]	.322	.716	.203	1	.653	1.380	.339	5.610	
[usr7=1]	0 <sup>b</sup>			0					
[revenues_EUR_cat4=1.00]	2.294	.930	6.086	1	.014	9.917	1.602	61.377	
[revenues_EUR_cat4=2.00]	.789	.818	.931	1	.335	2.202	.443	10.941	
[revenues_EUR_cat4=3.00]	.307	.968	.101	1	.751	1.360	.204	9.067	
[revenues_EUR_cat4=4.00]	0 <sup>b</sup>			0					
[pct_vol_fte_cat3=1]	-.306	1.272	.058	1	.810	.736	.061	8.911	
[pct_vol_fte_cat3=2]	-.611	1.180	.268	1	.605	.543	.054	5.482	
[pct_vol_fte_cat3=3]	0 <sup>b</sup>			0					
[org_form=1]	.017	1.124	.000	1	.988	1.017	.112	9.214	
[org_form=2]	.145	1.300	.012	1	.911	1.156	.090	14.774	
[org_form=4]	0 <sup>b</sup>			0					

a. The reference category is: Evaluation / Trial.  
 b. This parameter is set to zero because it is redundant.