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I2G Report on additional 3rd party content

The Intergeo Consortium

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Contents

1 Summary

This document describes the current status of the Dynamic Geometry items provided to the Intergeo project repository by external users. The possibility of having contributions by non-members (also referred to as 3rd-party contributions) has been explicitly considered in the description of Intergeo's workpackage WP5 goals, stating that "*Users can submit content to be reviewed, and this content will be included either in the internal or external review process* ".

As the notion of *3rd party* is not clearly defined in the DoW, we begin this Report describing the outcome of an internal debate about which proper definition of *3rd party* contributors should be chosen. In fact, although the idea of 3rd party seems to be natural and common sense, a moment's thought shows, in our context, that it has to be cleared in discussion within the Consortium. This discussion resulted into a specific list of Consortium members, which is included in the first Section of this report[1].

In the Section "Who are the contributors?", all 3rd party contributors are explicitly described. Then, using some simple criteria we elaborate different statistics about the community of 3rd party contributors. In the subsection "Identifying contributions" the contributions of 3rd party contributors (about 190) are described in detail. We used various criteria such as type of a contribution, language, country, age level, subject, topic, used software, competencies, ... Since the number of 3rd party contributors is low (20), we have added a table describing those 3rd party users which are not contributors, but which are registered (274). Some of them did not write their profile, but many did (104), so we are able to give a brief information about them as well.

Next, some further basic issues are commented. One of them deals with the difference between the current aggregated number of both consortium and 3rd party resources (less than 2000) and the expected number (circa 4500 by the end of Month 24) as stated in the DoW. The possible reasons for this situation are discussed.

At the Conclusion of this report we will introduce some suggestions on how to attract more contributors.

2 Introduction

The document containing the Description of Work (DoW) of Intergeo assigns an important role to community involvement at some key steps of the project. Workpackage 5 (WP5) is the main package in charge of fostering the community involvement in the project. According to the DoW, the objectives of this package WP5 (named *Gathering Communities of Practice*) are motivated and presented as follows:

> *In order to reach all countries of the EU, in particular the new member countries, this work package strives to gather key users of Dynamic Geometry Software (DGS) in different areas of the EU. A network of early adopters will be identified, and this network will be solidified by adding more users from the same region, and by encouraging communication between these communities of practice.*
>
> *Seven local user meetings all over Europe (Lithuania, Poland, Czech Republic, Italy, Luxembourg, Spain, France) will help to provide a complete European coverage. Teachers and Schools that are suitable for Quality assessment will be identified within the Communities of Practice.*

[1]For a variety of reasons, this list differs in several names from the list that was published in the deliverable "D1.4 Intergeo Annual Report October 2007 - September 2008".

> *User groups are not differentiated by the tools they use, but by their regional identification and thus the content they need. This also includes users from software that is not represented in the consortium.*
>
> *Another objective is the acquisition of further content that is currently in the public domain or with unknown legal status. Users can submit content to be reviewed, and this content will be included either in the internal or external review process. We will offer means to easily apply a Creative Commons or Public Domain license during submission, and the content without IPR clearance or requiring a fee will be rejected.*

The last paragraph of the objectives of WP5 explicitly mentions the importance of the external community involvement (i.e. roughly speaking, of the users of Dynamic Geometry Software (DGS) who are not consortium members), particularly regarding the submission of different constructions, exercises, animations, etc. built up using DGS. We will refer to any of these possible DGS outputs with the generic name of DGS *content* or, simply, as *content*.

These submissions were conceived in the DoW as an additional source of material for the INTERGEO repository and as a way of initiating the expected self-development of INTERGEO beyond the three years duration of the project. The DoW gives a relevant status to the acquisition of this additional content, since

- it devotes a specific Deliverable to report on this issue (this report)
- it specifies the yearly expected progression on the number of externally provided items (see section 2.2 below)

The title of this *Report on Additional 3rd-party Content* refers, therefore, to the current status of DGS figures, visual proofs, tutorials, etc. provided by the external community of DGS users. In what follows, the content submitted to the INTERGEO platform by this external community will be called *3rd-party content*. As the exact definition of the "3rd party" is not given in DoW, first we will attempt to precise it.

2.1 Definition of 3rd party

Who are 3rd-party with respect to the Intergeo consortium? What is its precise definition? This apparently silly issue has been, lately, subject of discussion by consortium members (telemeetings, phone calls, emails...). Now, since 3rd party refers to *others*, first we needed to learn who *we* are... Thus we arrived to the crucial conclusion that we first needed to learn who was included into the consortium, and who was not. The DoW did not provide a complete answer to this question, including just a few relevant names for each partner. On the other hand, a relation of persons who have cooperated –at different levels of involvement– to the first year Intergeo achievements, was appended to each partner description in the annual report D.1.4 (Sept. 2008), but not with a census purpose.

So a first and simple task we had to perform for this Report was to provide with a complete list of consortium constituent members as of June 2009, by explicitly asking the partners to send us such information, yielding the following

List of Consortium members

PHSG - University of education Schwäbisch Gmünd (6 members)

Ulrich Kortenkamp	Axel M. Blessing	Christian Dohrmann
Christian Markus	Kevin Kummerer	Daniel Truppel

UMP2 - Université Montpellier (18 members)

Christian Mercat	Caroline Bardini	Isabelle Gache
Abdeljalil Haraki	Noél Lambert	Antoine Leroux
Jean-Michel Oudom	Arnault Ioualalen	Henri Lesourd
Benjamin Clerc	Jean-Marc Ravier	Christian Buso
Paul Byache	Patrice Debart	Emmanuel Ostenne
Daniel Mentrard	Sylvain Bourdalé	Jean-Baptiste Brisson

DFKI - German Research Center for Artifical Intelligence Saarbrücken (6 members)

Paul Libbrecht	Michael Dietrich	Martin Homik
Christophe Zimmer	Arnaud Ialalouen	Henri Lesourd

Cabrilog SAS Grenoble (4 members)

Colette Laborde	Jean-Marie Laborde	Pierre Laborde
Thierry Bissuel		

UBAY - University of Bayreuth (8 members)

Alfred Wassermann	Peter Baptist	Matthias Ehmann
Carsten Miller	Wolfgang Neidhardt	Dagmar Raab
Bianca Valentin	Heiko Vogel	

ULUX - Université du Luxembourg (3 members)

Yves Kreis	Ingo Schandeler	Carole Dording

UCAN - Universidad de Cantabria Santander (15 members)

Tomas Recio	Maria José Gonzáles López	Cecilia Valero
Laureano González Vega	Mario Fioravanti	Francisco Botana
Miguel Abanádes	Jesús Escribano	Jose Manuel Arranz
Jose Antonio Mora	Jose Luis Valcarce	Manuel Díaz Regueiro
Carlos Ueno	Rafael Losada	Manuel Sada

TUE - Technische Universiteit Eindhoven (4 members)

Maxim Hendriks	Arjeh Cohen	Hans Cuypers
Hans Sterk		

M4M - Maths for More (3 members)

Daniel Marques	Ramon Eixarch	Santiago Egido

USB - University of South Bohemia (4 members)

Pavel Pech	Roman Hašek	Pavel Leischner
Jiří Vaníček		

It should be remarked that there are different persons and groups which are closely connected with consortium partners and members, sometimes at the same work place, closely collaborating with the project (for instance, some groups in the INRP, cooperating with the partner UMP2, or some associated partners or national representatives –but not all–) yet, they do not belong to the consortium according to the final definition that we have, after reaching a consensus with all partners, adopted.

Anyway, by considering now the whole collection of resources in the Intergeo platform, the list of those who have provided such content, and by taking there the complement to the above list, we will get those resource providers that should be understood as 3rd party contributions.

3 Who are the 3rd party contributors?

In fact, we have been provided by the platform managers with a complete list of all users (i.e. those who have been registered as platform users for whatever purpose), since it seems not immediately feasible to obtain a list of all resource providers.

We took, then, the total number of users (351) and from this number we subtracted the number (54) of the consortium members who are registered on the i2geo web page, and the number (3) of test users. This yields 294 3rd party users and, from this set of people we identified those who have contributed with resources, resulting in a number of just 20 (twenty 3rd-party contributors, who have in total contributed to 191 different resources (although some of them could be large collections of DGS items).

3.1 Identifying contributors

This number 20 seems very low. It is necessary to add that there are doubts about some of the 3rd party contributors we have found, despite its low number, regarding its potential membership to the consortium. We should also mention that sometimes it was not possible to identify with precision the specific origin of a contributor because the contributor did not fill in his/her profile. That is why we do not give any statistics in this regard. Perhaps we should mean that most contributors were either teachers or students and that they generally come from France, Germany, Spain and Italy, if the language used in the resource is to be considered a reasonable hint about their nationality.
More information can be given about 3rd party contributions.

3.2 Identifying contributions

As stated above, 3rd party provided content involves 191 resources. To describe them we used the following criteria:

- Language
- Country
- Age level
- Kind of a contribution, type of a task (exercise, tutorial, animation,..)
- Topic
- Used software
- Competencies

The characteristics by language are as follows:

Language				
English	French	German	Spanish	Italian
1	160	18	8	4

We see that the most of 191 resources are written in French. The rest of resources are in German, Italian, Spanish and English.

By country we can distinguish resources as

Country	France	Germany	Spain	Switzerland
Resources	160	19	8	4
Contributors	10	5	4	1

The table of country origin matches quite well the language table given above.

Next we will describe contributions by type of software.

Software							
Cabri	Cinderella	GeoGebra	Geometrix	Geonext	GeoPlan/GeoSpace	TracEnPoche	Other
6	5	12	144	17	2	3	2

We see that most of the used software comes not from DGS which is involved in the consortium. In fact, most of them use Geometrix software, which does not belong to the consortium but its representative Jacques Gressier figures as an associate partner to the project. The used software also reflects the variety of DGS software which is used in France.

Another feature which is explored deals with the type of a resource. It could be Exercise, Tutorial, Multiple, Graphic Organizer, Animation, Experiment, Worksheet, Simulation, Lab,... Each of these types is not clearly defined and perhaps it should be clarified (although sometimes the types are overlapping and it is difficult to determine it).

Instructional Component Types					
Exercise	Tutorial	Multiple	Graphic Organizer/ Worksheet	Animation/ Simulation	Experiment/ Lab
147	3	9	15	6	11

From the table we see that most of resources are of the type exercise.

Next table gives an overview of history of accumulation in the course of years 2008-2009.

History of accumulation						
XII. 2008	I. 2009	II.	III.	IV.	V.	VI. 2009
2	3	4	143	16	22	1

We can see that the most fruitful period of contribution were the last three months. The enhancement of the platform since last report D5.2 due to many efforts of taking into account the problems mentioned in D5.2 probably explains this huge increase in the number of contributions over the past three months.

Relation between contributors and right holders gives an interesting view.

Relation between contributors and right holders	
Contributor is Rights holder	54
Contributor collaborate with Rights holder	37
Contributor is not Rights holder	100

We see that most contributors are not right holders. We should be very careful in this regard to avoid problems!

Another table shows the dependence of the resources on educational level.

Educational level - age of pupils					
11 - 12	12 - 13	13 - 14	14 - 15	15 - 16	not specified
35	54	62	6	2	32

From the table above we see that almost all materials target pupils of lower age levels corresponding to the basic school. This is not surprising as most of the contributions come from France. The use of Dynamic Geometry environments in France usually is more important at the "college" level (first part of secondary school, 11 to 15 year-old students) than at the "lycee" level (second part of secondary school, 15 to 18 year-old students).

Trained competencies which have been specified in one case and subject topics of the provided resources are given in the following tables

Trained topics	
Topic	**Incidence**
quadrilateral	44
triangle	35
transformation	17
straight line	14
proof	13
circle	11
unknown	7
arch, rhombus	6
height	5
function, parallelogram, solid object, trigonometric function	4
angle, Cartesian coordinates, tangent, trigonometric ratio	3
geometric object, perpendicular bisector, right angle, right angled triangle, right prism, variation	2
construction recipe, function properties and attributes, gradient, proof, triangle, affine function, distance, dynamic geometry software, extremal values, Fläche, formula of a function, graphical representation, incircle, inequation, intersection, linear function, Median, multiplication, parabola, point, point of symmetry, probability, protractor, Pythagora's theorem, quadratic function, real world situation, rectangle, Satz des Thales veranschaulichen, similar, sine, sphere, square, use appropriate formula to find circumferences, x-coordinate of a point, y-coordinate of a point	1

Trained competencies	
Competency	**Incidence**
comparer des aires, conjecturer dans les activités géométriques	2
connaître la définition de la hauteur d'un triangle, connaître les propriétés du carré, connaître les quadrilatères, construct a simple figure, den ungefähren Kosinuswert mit dem Taschenrechner berechnen, déterminer la fonction affine associée à une droite, express dependencies between mathematical objects, justify a conjecture, know the definition of square, rectangle and rhombus, lineare Ungleichungen mit ganzzahligen Koeffizienten lösen, make conjectures, Probleme durch Nutzung von linearer Ungleichheit lösen, understand Pythagoras theorem, use a spreadsheet to represent data, use cosine definition, use Pythagoras theorem to solve 2D problems, use the invariance of the inequality sign when multiplying the two members of an inequality by the same positive number, use ITtools to make plots, work with dynamic images, plot trigonometric functions, sketch graph of sine cosine tangent function, use sine cosine and tangent in right angled triangles, draw an isosceles triangle, Satz des Thales veranschaulichen	1

One may wonder why the contributions did not make use of the possibility offered by the platform of mentioning competencies trained by the resource. Most contributions were just copied from traces and are not fine grained with *two kinds* of granularity we are considering in Intergeo. From this incomplete use of the platform by some contributors, it seems that the granularity of the contributions should be analysed in the future, see the Section 4, where this issue is discussed.

Finally, the last table offers an overview of the used licenses.

License Deeds			
cc-by-nc-sa[1]	cc-by-sa[2]	GFDL[3]	I2geo License[4]
5	144	2	40

3.3 Identifying other external users

Besides consortium members and third party contributors there are also users which are registered at Intergeo who are *not* contributors. In addition to the mentioned fifteen 3rd party contributors we have identified 274 3rd-party users. Only 104 of them have their profile filled with relevant information that we could present in the following tables.

[1] cc-by-nc-sa ... Creative Commons, by-attribution, non-commercial, share-alike,
[2] cc-by-sa ... Creative Commons, by-attribution, share-alike,
[3] GFDL ... GNU Free Documentation License,
[4] I2geo License ... Creative Commons Attributions 3.0.

Country	**Users**
Spain	26
France	13
Portugal	12
Germany	9
Brazil	5
Argentina, Italy, USA	4
Belgium, Greece, Turkey	3
Egypt, Mexico, Peru, Russia, Uruguay	2
Australia, Colombia, Croatia, India, Morocco, Romania, Switzerland, Tunisia, Vietnam	1

Member Types				
Teacher	Professional	Parent	Student	not specified
81	10	3	7	3

4 Discussion

If we look at the pages 51-52 of DoW, where numbers about expected results are presented, we find the following Performance Indicators:

Indicators-Targeted Projects	**Expected Progress**		
	Year1	**Year2**	**Year3**
Content aggregated[a]	3000	4500	> 6000
Increase in access[b]	3x	50x	200x
Increase in reuse[c]	6x	150x	300x
QA resources	0	>400	>600+external
Registered Web Site Users	1000	10000	>30000
Curriculum Mappings(countries)	5	20	25 (of 25)
School Coverage	25%	40%	90%

where

a) Content aggregated: The consortium itself provides more than 3000 resources. WP5 takes care of acquiring additional content from external sources and public domain.

b) Increase is measured with respect to pre-project for each year.

c) Increase in access/reuse: During the first year, we set up the necessary infrastructure (both technical and conceptional) that allows for an increase access. The interoperability measures we take will help more people to reuse existing content, which will boost reuse more than access at first. Later, the access will gain more, as the expected potential increase is higher.

...

Now, after our work in this Report, it was evident that we have to

- Explain why we have not reached the promised 3000 resources from within the consortium yet. Consortium members content now involves over 1000 resources and the 3rd party content is approximately 400 (if we unfold some items that are, indeed, large collections of DGS constructions).
- Explain why there are marked differences between countries and software.

From the table above we see that there is a big gap in all performance indicators. In the following lines we try to give possible explanation of this state:

- In our opinion one of main reasons for this delay are technical problems with the platform. Then potential users attracted to the use of INTERGEO at local users meetings, conferences, and other events are not sufficiently motivated to go on, because of the difficulties navigating on the platform. This has been already discussed in D5.2 and we refer to that deliverable for further details [2].
- A critical question is whether the numbers given in the table are not *too* high to fulfill them in this very short term. It seems that we can achieve these numbers in a longer period.
- Another reason is that identified resources are still big compounds and it is necessary to cut them into smaller parts. Probably, the problem with the "way of counting" was not considered when the performance indicators were first presented.
- Again, there are very different types of resources. This issue is not clearly addressed in the DoW. We can have resources that are exercises, tutorials, graphic organizers, animations, experiments, worksheets, simulations, labs, etc. Each of these types of resources requires different labour effort and this is not considered in DoW. Then it can really happen that a resource of tutorial type is ten times more time-consuming than a resource of the type of exercise or just a simple figure to show something. Performance indicators should have assigned "weights" to these very different kinds of resources.
- There was a discussion on the problem of granularity of resources, competencies, annotations, ... For the future this granularity issue is really important, both at the level of resources and competencies. We should reorganize the content into finer grained entities bundled into more structured activities comprising a bare figure and satellite documents, addressed to different kind of people, the teacher, the students, the community (history of the resource, traces of students production, . . .). As a first step, we propose to distinguish the following levels of resource granularity:
  - broad-external: a simple link to a potentially large collection of documents
  - broad-internal: a simple archive to a collection of documents
  - activity: a single activity packed altogether with advice, instructions, and interactive material
  - sliced: the interactive geometry construction and advice texts are separate
  - sliced-i2g: same as sliced but the construction can be converted to many formats

  In the same way, the annotation granularity levels could be:

  - very broad concepts (typically topics)
  - precise concepts (e.g. theorems)
  - precise competencies

[2] Although D5.2 details some reasons behind the problems, efforts have been made since D5.2 publication to correct them

5 Conclusion

We will conclude this report, despite the considerations above, with a few recommendations on how to attract new contributors.

5.1 Strategy to attract new contributors

As the platform gets more stable and user-friendly, we need to consider other initiatives to gather 3rd party content. Those that are close to the goals of WP5 could be the following:

- Writing articles on Intergeo issue. For example in the journals of national association of mathematics teachers of European countries.
- Visiting both national and local math conferencies on the use of new technologies in teaching mathematics, physics etc. in every country.
- To inform math students at Pedagogical faculties and other schools preparing students to teach mathematics about Intergeo.
- To inform the teachers of in-service training about Intergeo.
- To offer the sources of a high quality and demonstrate them.
- To translate attractive sources into various languages.
- To organize special events for teachers How to work with Intergeo?
- To inform the public about Intergeo at international level (conferencies (Hagenberg, etc.), journals).
- To prepare work sheets for teaching mathematics for various important topics (Theorem of Pythagoras, Euklid theorem, Theorem of Thales, . . .).
- To show how Intergeo contributes to obtain better professional knowledge. Pedagogical contributions.
- To concentrate on content and the quality of the sources.
- Cooperation with other European projects (running or in preparation) of similar topics (InnoMathEd - Innovations in Mathematics Education on European Level , LEGIs - Local European GeoGebra Institutes, EMATEC - European Certificate for Technology in Mathematics Education, . . .).

6 Version History

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